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With U.S. hardwood sawtimber growth exceeding removals, export markets are attractive. Production, marketing changes needed to improve offshore acceptance, however

Good potential seen for hardwood exports

By Philip A. Araman

Princeton, West Virginia

Looking at the inventory of standing hardwood sawtimber and hardwood removals in relation to annual growth, one sees considerable potential to export hardwoods from the United States.

However, major increases in exports to Europe, Canada and Pacific Rim countries at this time are generally restricted by preferences for a relatively few species and by a limited amount of export-quality material. Future export increases depend on the acceptance of less-preferred species, increased logging and lumber production, increased acceptance of "less than perfect" veneer, and increased shipments of strip and dimension stock made from No. 1 and No. 2 Common lumber.

The current situation

Hardwood exports over the last 10 years have been increasing and foreign demand should continue to grow. Principal markets are shown in Fig. 1 by product type: logs, lumber, veneer and plywood. Europe, Canada and the Pacific Rim received at least 94% of the logs, lumber and veneer exported from the U.S. and almost 70% of exported plywood.

Fig. 2 shows principal hardwood species exported, with the same product breakdown. The oaks, red and white, accounted for over 60% of the logs, lumber and veneer exported and led the plywood category with 42%.

U.S. hardwood export trends from 1973 through 1983 are charted in Fig. 3. Lumber exports have more than doubled over this period. Exports of logs, veneer and plywood have increased moderately, except for a drop in log exports in 1982 and 1983.

These trends are traced by product in the three major market areas—Europe, Canada and the Pacific Rim—in Fig. 5 (on p. 36). Some observations:

- Shipments to Europe for all products increased, and there is potential for continued growth.
- Canada is the single country importing the most U.S. hardwoods, although they re-export some lumber to Europe and other areas and export veneer cut from U.S. logs to Europe and other areas and back to the U.S.
- Exports of veneer and lumber have increased dramatically to the Pacific Rim area since 1977. Log exports peaked in 1974, dropped in 1975 and 1976 but have increased steadily since that time. This marketing area may have the greatest potential for growth.

The U.S. and the world

Figures for 1981 show the U.S. hardwood sawmill industry is the largest in the world, at 7 billion bd ft producing 15% of total sawn hardwoods. The USSR and India are the next two largest producers, with 11% and 9% respectively, but they are not major hardwood exporters. China, Brazil and Japan follow, each with about 7% of the total, but

FIG. 1—Principal hardwood product export markets

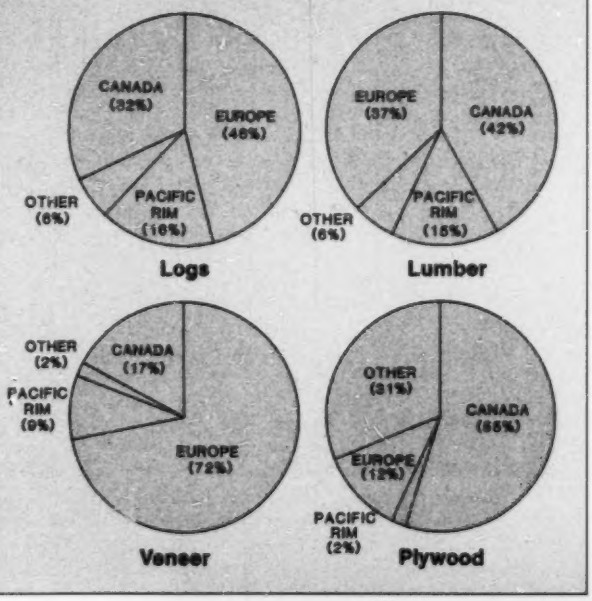

FIG. 2—Principal species exported by product type

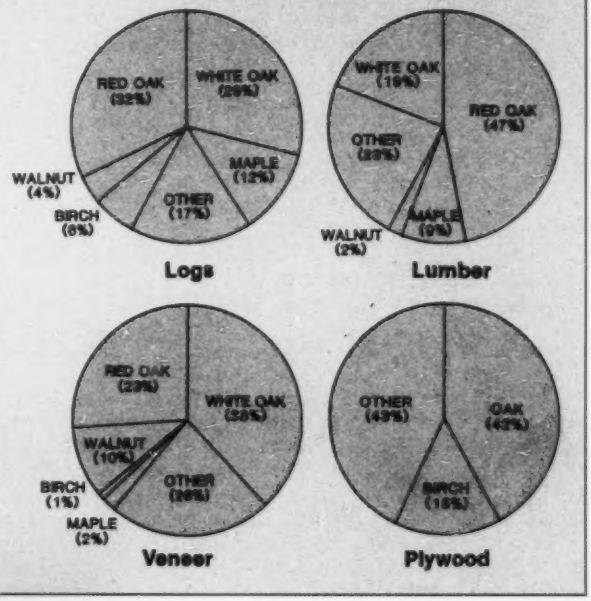

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FIG. 3—U.S. hardwood product export trends from 1973-1983

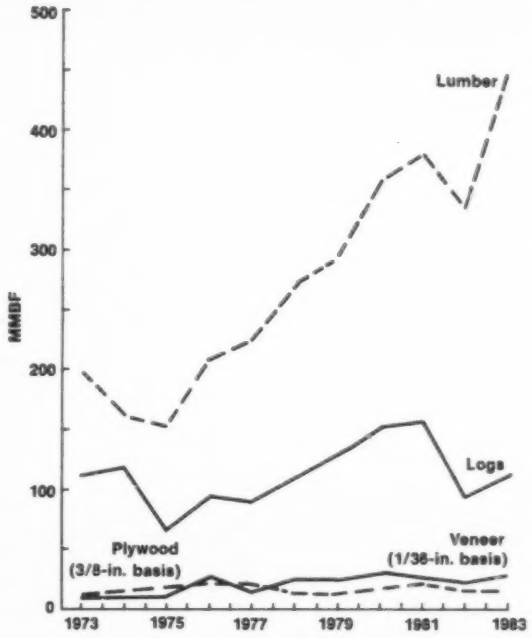
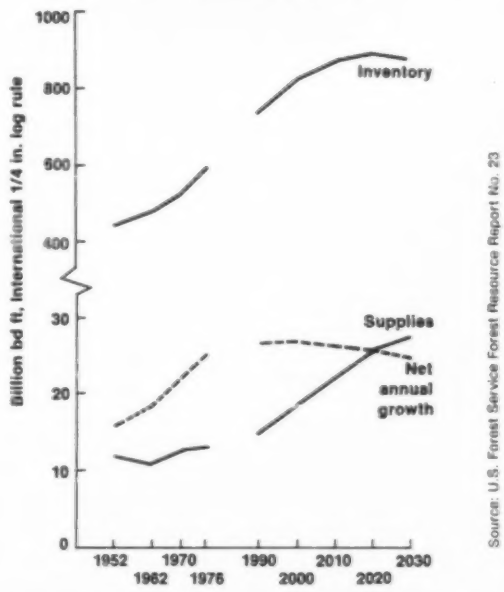


FIG. 4—Hardwood supplies, annual growth, and inventory

1952-1976, with projections (base level) to 2030



of the three only Brazil is a significant hardwood lumber exporter.

The U.S. ranked fourth in the world as a sawn hardwood exporter that year, according to the *FAO Yearbook of Forest Products*, exporting about 5% of annual production. The U.S. was the No. 1 exporter of temperate hardwoods.

On the resource side, the U.S. continues to have an abundant inventory of hardwoods, as noted in Fig. 4. Sawtimber inventories have been increasing because use has been far less than the net annual growth.

Hardwood sawtimber inventory in 1976 was around 600 billion bd ft, including approximately 57 billion bd ft of western hardwoods. At the same time, net annual growth in sawtimber was more than double the harvest volume. The U.S. Forest Service projects net annual growth in excess of removals until 2020, when sawtimber inventory will be about 900 billion bd ft.

What about quality?

McLintock (1983) compiled, from survey information, sawlog quality in standing timber for the 17 eastern states (Table 1). In logs, he found only 33% in Grades 1 and 2, leaving 67% in Grades 3 and 4. Thus the overall quality of the resource is not that good.

Given the "in-the-woods" log grade mix, we estimated the "at-the-sawmill" log grade mix, or what sawmillers accept. Sawmillers often refuse Grades 3 and 4 logs, and veneer mills get many of the Grade 1 logs. Therefore, sawmillers use a higher grade mix than the "in-the-woods" distribution, as Table 1 shows.

Applying the oak tables in NE-468 by Hanks et al. (1980), we obtained the "lumber yields" shown in Table 1. From our estimates, only 40% of the lumber produced is No. 1 Common and Better.

Generally speaking, FAS and SEL (Select) grades of lumber are exportable to Europe if they are square-edged and bark-free. Some No. 1 Common can be remanufactured and upgraded to export market specifications, and some No. 1 Common is exported along with SEL in a grade mix called COMSEL.

Canadian and Pacific Rim importers are not as insistent on top-quality mate-

TABLE 1—Sawtimber quality and lumber yield estimates

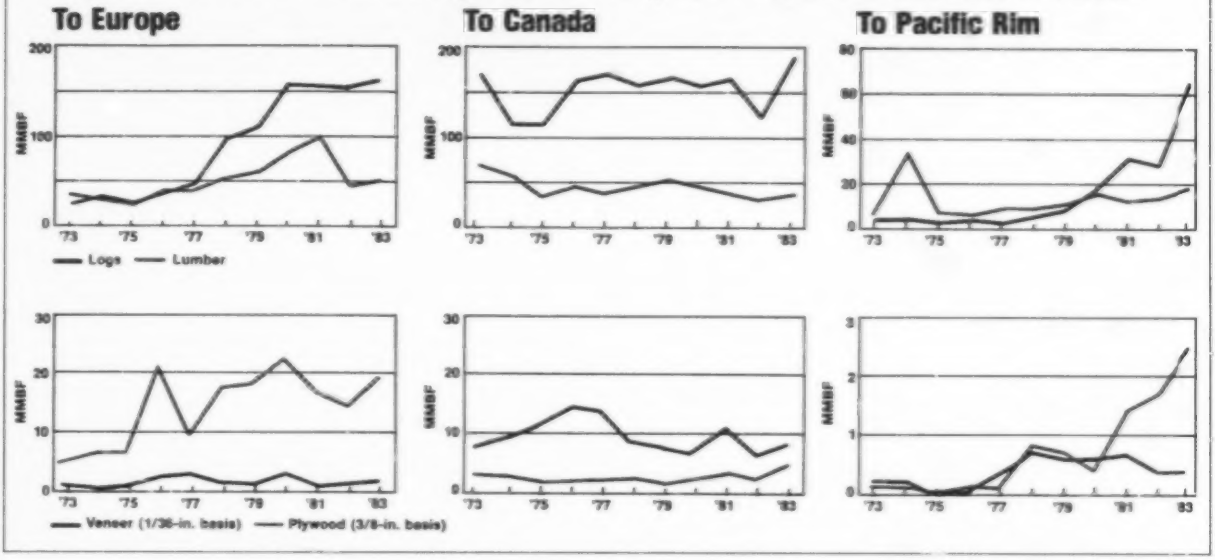
In the woods		At the sawmill		Lumber yields		
Log grade	% of sawtimber	Log grade	% of logs	Grade	%	
1	13	1	20	FAS	8	
2	20	2	35	SEL	7	
3	47	3 & 4	45	1C	25	
4	20			2C	28	} 60
				Below 2C	32	

TABLE 2—U.S. and world demand index for hardwood lumber, 1970-2000

10-year period	U.S. demand	World demand	World import demand*
1970-1980	0	+12	+38
1980-1990	+39**	+23	+47
1990-2000	+14	+17	+30

* Excludes U.S. demand.
** Considered high by some industry sources.
Source: National Forest Products Assn.

FIG. 5—U.S. hardwood product export trends from 1973-1983



rial and purchase No. 1 Common and Better lumber. However, since domestic demand for this limited, high-and-medium quality material is generally keen, there is not a great volume of readily-available lumber in the major fine hardwood species for the export market.

U.S. forests produce an excellent variety of hardwood species to offer on the export market. However, this excellent variety is not being exported. The U.S. needs to export more species than just the highly-demanded select red and white oaks which account for about 19% of standing sawtimber.

Future demand

Forecasts for the future are optimistic. The past and future world demand for hardwood lumber, as estimated by National Forest Products Assn. (1981), is shown in Table 2. World and U.S. demand are predicted to increase 28% and 39%, respectively, in the 1980s, and 17% and 14% in the 1990s.

World import demand (excluding U.S.) for hardwood lumber, which increased dramatically in the 1970s, is forecast to continue increasing through the 1990s. Much of this demand is centered in Europe and the Pacific Rim.

How to increase exports

U.S. hardwood exports can increase because:

- Forests contain an excellent variety of hardwoods and an abundant inventory of hardwood trees.
- Wood growth exceeds use.
- The U.S. is the No. 1 producer of sawn hardwoods in the world.
- Export demands have been increasing, and this trend should continue.

However, for U.S. hardwood exports to increase, the industry must:

- Provide foreign customers with products they need and not only what mills produce for domestic use.
- Increase the number of companies willing to export or get more hardwood to current exporters.
- Be willing to commit a percentage of production to the export market.
- Export more upgraded lumber, more strip stock, more dimension stock (edge-glued panels or blanks and dimension parts), "less-than-perfect" veneer, and a wider variety of species.
- Remain competitive in the international marketplace.

The following research is needed to achieve the goal of increasing hardwood exports:

- Determine the effects of rules, tariff and non-tariff barriers, subsidies, and other institutional constraints upon trade.
- Determine the effects of such factors as exchange rates, prices of substitute species, production costs, ocean freight rates and other economic variables on the export market for hardwood products.
- Determine the needs and specifications, process requirements and economic potential for value-added hardwood products in Europe and Pacific Rim market areas.
- Determine the degree to which less-preferred species can be substituted and merchandised in international trade.
- Identify market opportunities for hardwoods in higher, value-added forms such as strip stock, edge-glued panels or blanks, and dimension parts.
- Develop guidelines to aid producers in evaluating and entering international markets.
- Assess and overcome problems of financial resources that inhibit the export of hardwood products.
- Assess the financial risks associated with export marketing and develop means for their quantification and elimination.
- Assess the potential of export trading companies. ■

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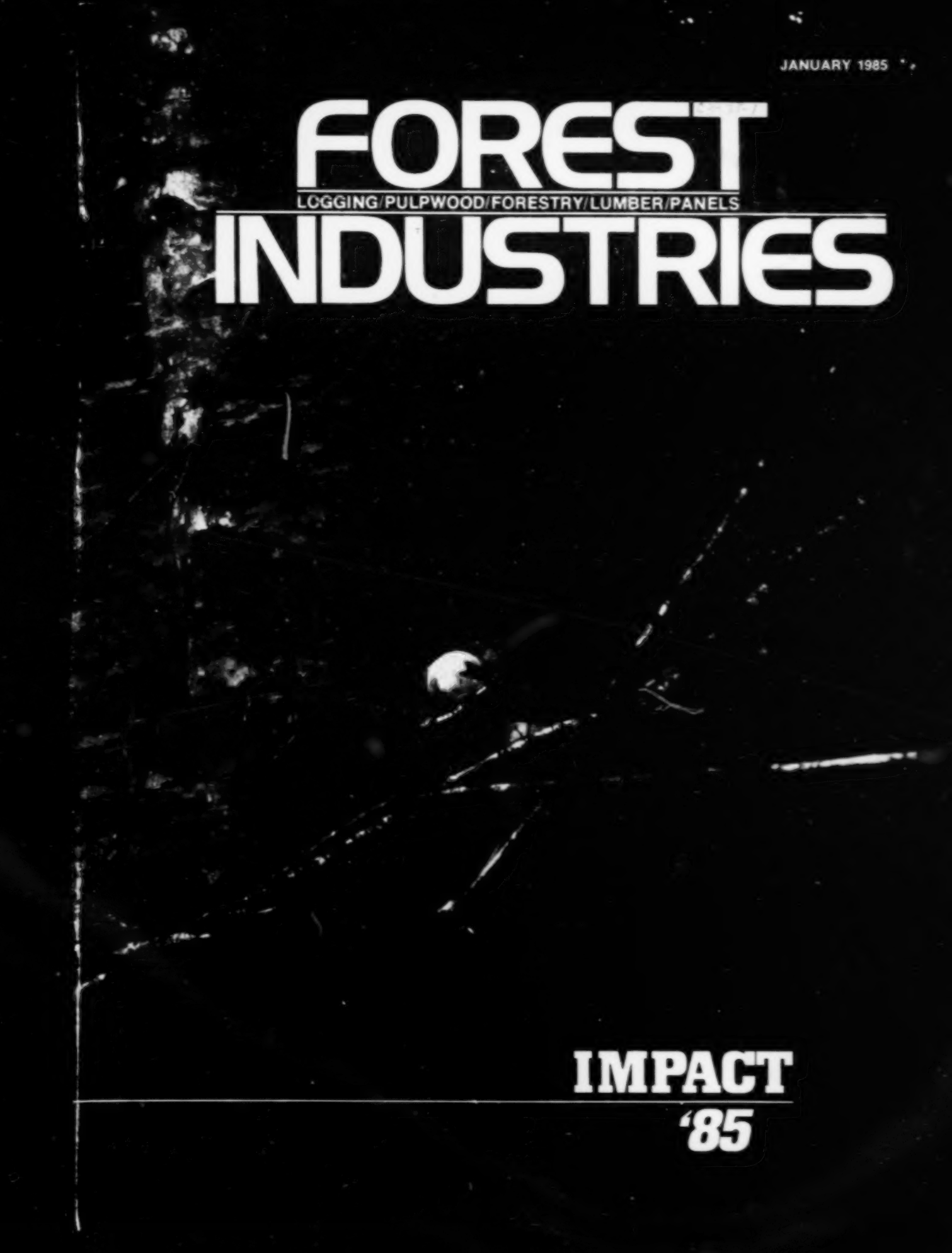
LOGGING/PULPWOOD/FORESTRY/LUMBER/PANELS



IMPACT '85

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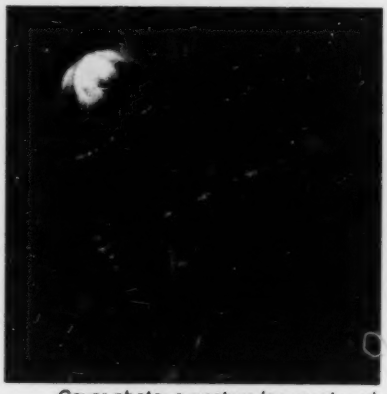


Cover photo: a western logger at work

Spokesmen for major interest groups on both sides of the Canadian lumber import issue state their case as U.S. producers prepare again to defend their turf

Canadian lumber: free market or unfair edge?

Atlanta, Georgia

No examination of issues confronting the forest products industry at the beginning of 1985 would be complete without a review of the Canadian lumber import controversy, which is taking on new momentum.

More softwood lumber production capacity exists in the United States and Canada than the market can absorb, and the climate of depressed prices and subdued demand has heightened competition for customers in the U.S.

It also has produced repeated claims from quarters south of the border that Canadian mills enjoy an unfair edge in U.S. markets: a stumpage pricing system that gives them lower costs than are available to U.S. producers, coupled with a significant currency exchange advantage.

Figures vary with sources (as can be seen by the accompanying tables), but about one-third of the softwood lumber consumed in the U.S. in 1983 came from Canadian mills, a growing trend. Whether or not that represents free competition is the overt issue in the ongoing controversy. (The covert issue is more related to traditional protectionism: in hard times, who gets first dibs on the local market?)

According to the National Forest Products Assn., which closely monitors U.S. Bureau of the Census figures, U.S. imports of Canadian softwood lumber in 1983 reached 11.7 billion bd ft, a 33.6% share of U.S. consumption. This import volume was valued at US$2.5 billion, 58% of the total value of U.S. wood imports in 1983.

NFPA has asked for an investigation to determine if any U.S. trade regulations are being violated and will hold back from participation in any legal or legislative actions in the meantime.

Other groups, principally those whose members are threatened by closure due to lost markets, are less reticent. More than 50 U.S. industry representatives met Oct. 24 in Dallas, Texas, to examine legislative and administrative options for curtailing Canadian lumber shipments into the U.S. Several companies were represented which did not participate in earlier expensive and futile efforts to obtain a countervailing duty, indicating that the unrest is growing.

Canadian softwood lumber imports compared with U.S. consumption, 1975-1984
(million board feet)

Year	U.S. Prod.	Canadian Imports	Other Imports	Total U.S. Consumption	Canadian % of U.S. consumption
1975	24,569	5,665	45	30,280	18.7%
1976	27,608	7,906	45	35,558	22.1%
1977	29,668	10,344	42	40,054	25.8%
1978	30,382	11,764	77	42,223	27.9%
1979	28,550	11,068	50	39,668	27.9%
1980	23,806	9,514	25	33,345	28.5%
1981	22,086	9,182	23	31,291	29.3%
1982	22,054	9,091	28	31,173	29.2%
1983	27,033	11,947	30	39,010	30.6%
1984*	16,659	7,493	25	24,177	31.0%

(*seven months)

Note: Includes revised southern pine volumes, 1978-1984.

Source: Northwest Independent Forest Manufacturers, citing statistics from Western Wood Products Assn., National Forest Products Assn. and Southern Forest Products Assn.

Observers agree there are three legal avenues open to the anti-import coalition:

- File another countervailing duty petition—unlikely to occur.
- Prove "substantial damage" and seek redress under the 1930 Trade Act, requiring approval by the International Trade Commission and the President.
- Prove production cost differences represent "dumping" of Canadian lumber in the U.S.

Voluntary quotas have been mentioned (not by the Canadians), but any arrangement between producers, however informal, suggesting possible violation of anti-trust laws is being shunned by all parties.

Meanwhile, Rep. Jim Weaver (D-Ore.) declared himself in the game by scheduling a hearing on the subject for Dec. 18 in Portland, Ore.

There's no question. Many U.S. producers are in financial quicksand and are looking for a rope. Their frustration was expressed by M. J. "Gus" Kuehne, executive vice president of Northwest Independent Forest Manufacturers: "If Canadian mills had to pay the same price for logs as mills in the Northwest, we would have maintained our market share over the past decade and a dozen more mills in western Washington would be running today."

To provide a forum for expression of views on this controversy, FOREST INDUSTRIES asked spokesmen for two major interest groups to submit statements expressing their positions on the subject: T. M. Apsey, president and chief executive officer of the Council of Forest Industries of British Columbia, Vancouver, B.C., and John C. Milliner Jr., executive vice president of Southeastern Lumber Manufacturers Assn., Forest Park, Ga.

The accompanying tables were not furnished by the two authors but came from our own accumulated reference on the subject.—*Ed.*

Stumpage formulas: Different, yes. Subsidy, no.

Vancouver, British Columbia

A YEAR AND A half ago, the International Trade Administration (ITA) in Washington, D.C., denied the petition of a group of American lumber producers for a countervailing duty on Canadian lumber. The decision did not, however, quell the controversy over Canadian lumber imports. And depressed prices have done much to breathe new life into the issue.

The main allegation of the U.S. producers who launched the countervailing duty petition—and of those who continue to seek restrictions on the importation of Canadian lumber into the U.S.—is that Canadian governments effectively subsidize Canadian industry through low stumpage rates. They argue that Canadian lumber thereby enjoys an unfair advantage in the U.S. market.

It just isn't so.

Although similar in some respects, stumpage systems across Canada and the U.S. vary. In British Columbia, for example, the formula is designed to respond to market conditions by linking stumpage charges to the current market value of end products. Hence rates are adjusted upward in good markets and downward in bad markets.

In contrast, the stumpage system in place on most of the public forest land in the U.S. sets the value of stumpage on federal and state timber by means of a speculative bidding process which fixes stumpage rates for a period of three to five years. During the buoyant market of the late 1970s, when economists were mistakenly predicting a house-building boom well into the '80s, U.S. forest companies bid timber values up to excessively high levels.

When spiraling interest rates caused the market to collapse, many U.S. companies were left holding expensive timber contracts. Some defaulted and Congress passed legislation in 1984 which enabled remaining companies to buy their way out of extended contracts at reduced levels.

Filet mignon vs. hamburger

Comparing stumpage rates bid in the U.S. during the heady days of late 1979 and 1980 with current Canadian stumpage charges is like comparing filet mignon and hamburger. The industry on both sides of the border has been through the grinder in recent years. The U.S. rates bid in 1979 reflected the then-held expectation that lumber prices were going nowhere but up. Current Canadian rates reflect the reality that they have gone nowhere but down.

Much of the debate which has arisen over Canadian stumpage rates also overlooks the fact that stumpage is only one element of many that make up the total cost structure in both industries. All taxes, royalties and other charges applicable in each system have to be examined before passing judgement on the reasonableness or fairness of one aspect.

Such an evaluation did take place, in exhaustive detail, during the quasi-judicial investigations which followed the filing of the countervailing duty petition in 1982.

Differences between Canadian and American stumpage systems, tenure systems, rate of cut control, comparative industrial tax burdens, species composition and the many other factors that make up the total cost picture on either side of the 49th parallel were painstakingly documented and verified by the International Trade Administration of the U.S. Department of Commerce during a seven-month investigation.

The findings of that investigation are a matter of public record, available through the U.S. Department of Commerce in Washington, D.C. To make a long story short, allegations that Canadian stumpage systems represent an unfair subsidy did not stand up to independent analysis. In fact, studies by recognized authorities on both sides of the border have repeatedly demonstrated that when adjustments are made for the differences mentioned above, and relevant costs are added up, the Canadian system does not confer an advantage to Canadian producers.

Poor markets revive issue

Canadian producers assumed that the ITA decision would be the final word on the matter. The 1982-83 countervailing duty action was not the first time some American producers had cast a critical eye upon the Canadian share of the U.S. softwood market. A flip through the history books shows that complaints about Canadian lumber usually coincide with the market downturns that recur in the cyclical wood products industry.

But in between those downturns, Canadian lumber hasn't been a sore point at all. In fact, the situation has been quite the reverse. Canadian lumber has been needed to meet a U.S. demand for softwood products that has historically exceeded domestic supply.

There is plenty of suffering to go around. Canadian producers are not sipping champagne while their counterparts go broke. Our two industries face similar problems

Recovery was just beginning in the U.S. when the final determination on the lumber case was rendered. Canadian producers obviously hoped that recovery would reduce tension and restore healthy markets for all concerned.

As it turns out, recovery came in only a half-measure. American housing starts so far this year have rebounded to an average of 1.8 million on a seasonally adjusted basis. Demand did recover. Unfortunately, prices did not.

The problem is, of course, that the North American industry has been producing record volumes of lumber. There are several reasons for this.

Expansion, upgrading and increased productivity in both Canadian and American mills has had a major impact on supply. Consumer preference has been a factor in dictating the Canadian share of existing markets. Some American home builders prefer Canadian species over domestic ones for some applications. They are attracted to specific qualities of the wood including its lightness, strength and workability.

Regulatory restrictions on U.S. producers have also influenced Canadian market share. The Jones Act, for example, effectively puts West Coast American producers using water transportation at a disadvantage in their own market.

But by far the most significant factor encouraging Canadian lumber imports has to be the strength of the U.S. dollar. The high value of the U.S. dollar has

obviously hurt American exporting industries and import-competitive industries such as the domestic forest industry. The diminishing value of the Canadian dollar with respect to the stronger American dollar has clearly conferred an advantage on Canadian producers. But the value of the Canadian dollar is a sword that cuts both ways. It has also meant, for example, that Canadian companies must pay more for the equipment and machinery they import from the U.S.

Moreover, internationally, the Canadian dollar is linked to the American dollar, and while it has diminished in value relative to the U.S. dollar, it has appreciated along with the U.S. dollar with respect to other currencies. Thus while the relationship between our two currencies has been a boost for Canadian lumber producers in the North American market, we have shared in the bust which has occurred in overseas markets.

Unfortunately, in the short term at least, there is not much that either of our industries can do about it. A more favorable alignment of currencies will require a reduction in the deficits of both our nations and further improvement in offshore economies.

What it all adds up to is difficult and divisive times in the North American forest products business. But there is plenty of suffering to go around. Canadian producers are not sipping champagne while their counterparts go broke. Our two industries face similar problems.

Shoot-out would occur

In the midst of all the recent controversy over Canadian lumber it is worthwhile to reflect that Canada and the U.S. probably interact more extensively than any other two countries in the western world. We are each other's most important trading partner, and oldest friend and ally. A trade barrier that would effectively keep Canadian lumber out of the U.S. market would be the largest economic blow ever dealt to Canada by the U.S. It would in all likelihood ignite a bitter and escalating round of retaliation and counter-measures. The effect of such a protectionist shoot-out would be highly damaging for both economies.

Neither country can afford to lose sight of the fact that much of the prosperity we both enjoy today came from free trade. To begin raising barriers now would be to join a game nobody ever truly wins.

If the recent recession taught us anything, it is that competitiveness is the key to domestic and international success in our industry. If it is to survive, the North American wood products industry must be world-class, not just the best in this state or that province.

Competing with each other can sometimes be painful, but it ultimately brings out the best in both of us. In so doing, it ensures the future viability and vitality of our industry and the many jobs that depend on it. ■

—T. M. Apsey

U.S. imports of softwood lumber, by species and country of origin, 1978-1983
(million board feet)

	1978	1979	1980	1981	1982	1983
Spruce	6312	6740	6166	6011	6341	8354
Canada	6311	6735	6165	6009	6340	8353
Other countries	1	5	3	2	1	1
Douglas fir	976	827	559	483	504	600
Canada	975	827	559	483	504	600
Other countries	1	0	0	0	0	0
Other fir	609	588	441	535	461	709
Canada	609	588	441	535	461	709
Other countries	0	0	0	0	0	0
Cedar	656	648	552	574	539	664
Canada	657	644	549	573	539	663
Other countries	1	4	3	1	0	1
Hemlock	1220	912	628	467	294	417
Canada	1219	912	625	467	294	416
Other countries	1	0	3	0	0	1
Eastern white & red pine	110	101	108	216	244	287
Canada	108	100	107	214	239	281
Other countries	2	1	1	2	5	6
Other pine	1800	1073	913	724	555	631
Canada	1752	1043	900	714	550	617
Other countries	48	30	13	10	5	14
Other species, all ctrys	49	33	14	19	31	75
Total softwood lumber	11834	10922	9383	9029	8969	11737
Canada	11572	10873	9359	9008	8943	11706
Mexico	3	2	2	1	1	12
Honduras	42	24	11	10	8	8
New Zealand	2	2	2	1	3	3
Other countries	15	21	9	9	14	6

Source: U.S. Bureau of the Census, via National Forest Products Assn.

Canadian share of U.S. softwood lumber markets, eastern states, 1982

Alabama	15.74%
Arkansas	7.24%
Connecticut	68.55%
Delaware	85.09%
District of Columbia	34.05%
Florida	62.61%
Georgia	61.25%
Illinois	42.54%
Indiana	50.47%
Iowa	31.33%
Kansas	52.73%
Kentucky	48.96%
Louisiana	6.07%
Maine	89.08%
Maryland	68.61%
Massachusetts	73.85%
Michigan	57.95%
Minnesota	57.91%
Mississippi	12.30%
Missouri	40.02%
New Hampshire	90.48%
New Jersey	64.84%
New York	60.88%
North Carolina	47.05%
Ohio	53.85%
Oklahoma	13.75%
Pennsylvania	63.97%
Rhode Island	85.12%
South Carolina	41.91%
Tennessee	39.16%
Texas	25.84%
Vermont	87.80%
Virginia	37.43%
West Virginia	81.89%
Wisconsin	36.28%

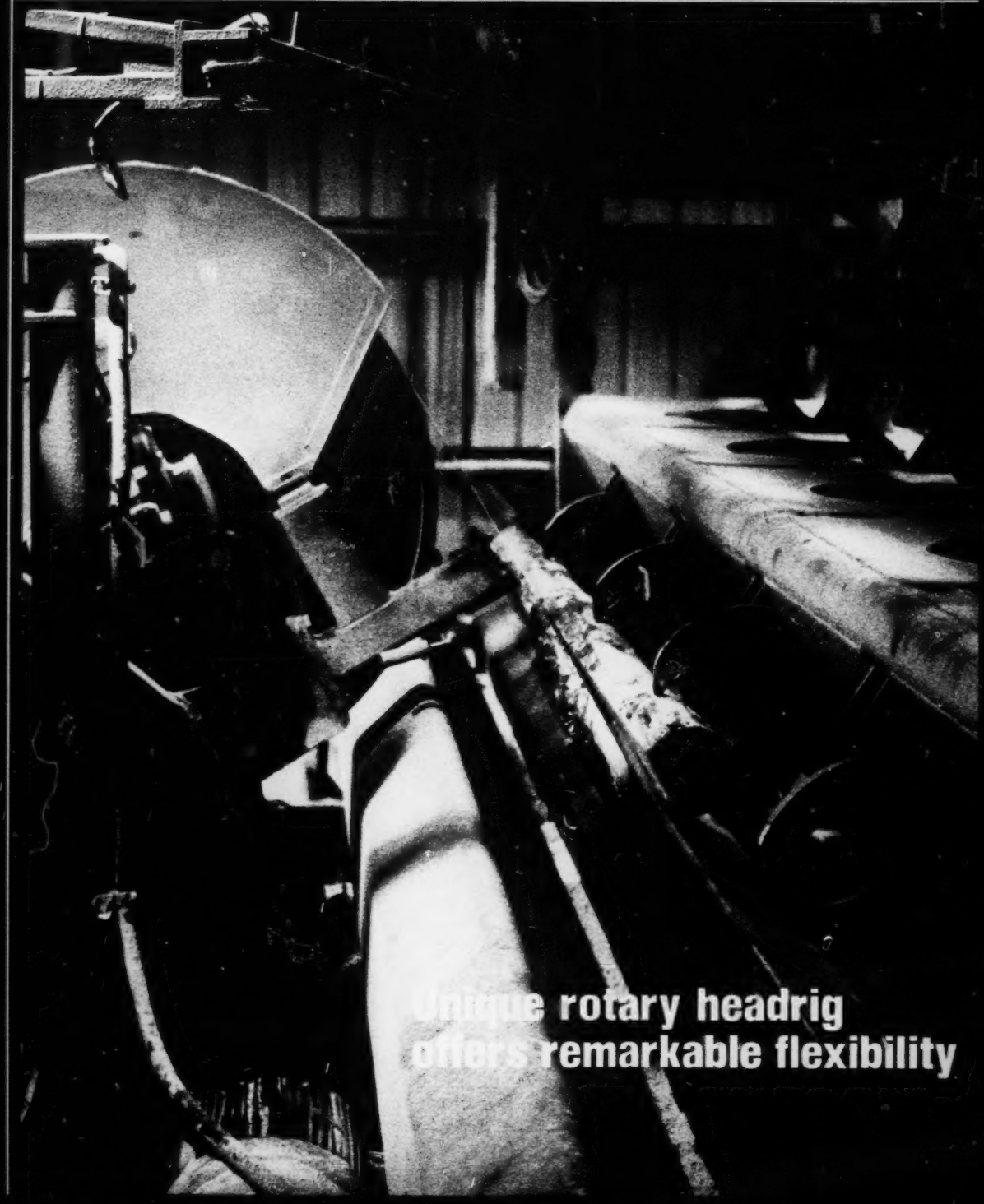
Source: Southern Forest Products Assn.

C3975-1

MARCH 1985

FOREST INDUSTRIES

LOGGING/PULPWOOD/FORESTRY/LUMBER/PANELS



Unique rotary headrig offers remarkable flexibility

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For forestry firms, '84 results look good

SAN FRANCISCO, CALIF.—For a good many U.S. forest products firms, 1984 turned out to be a pretty good year, financially. Had it not been for some unusual write-offs connected with such things as buyouts of federal timber contracts and charges related to trimming operations, the year would have been even better.

But the companies that did best tended to make most of their profits from pulp and paper operations. Although 1984's housing-start total of 1.74 million was about the same as 1983's, prices for building products were weak. This was especially true during the last half of 1984.

Percentages can be deceiving, but it does look good to be able to say your annual profits jumped 197%. Willamette Industries topped the FOREST INDUSTRIES chart with that figure, which represents a profit of $66.2 million on annual sales of $1.18 billion (a 13% increase over 1983).

Georgia-Pacific's results illustrate another factor that statistics can hide. Thanks to a $160-million charge related to the sale of its chemical business and a $2-million loss from that business's operations, G-P's fourth-quarter net was a loss of $99 million. However, fourth-quarter profits from continuing operations more than doubled to $63 million, while sales rose 15%.

Southwest Forest Industries wrote off $9.95 million in the fourth quarter to cover its "buyout" of 200 million bd ft of federal timber. This smothered a meager $918,000 profit for the quarter.

Potlatch's chairman and chief executive officer, Richard B. Madden, said wood products were 1984's biggest disappointment. Pulp and paper profited from strong demand, but decent demand for wood products couldn't overcome poor prices. Since the lumber and panel markets are likely to continue to suffer from oversupply, Madden said, Potlatch's wood products division is likely to have a hard time this year.

Harry A. Merlo, Louisiana-Pacific's chairman and president, also worried about oversupply: "In light of the negative impact on the lumber market resulting from high levels of Canadian imports, we're pleased with the performance we were able to achieve in 1984. While oversupply resulting from Canadian imports caused most lumber prices to remain relatively low throughout the year, excellent demand for several other products helped pick up the slack."

Industry sales and earnings

Company	1984 ($000,000) Sales	% Chg ('83)	Earnings	% Chg ('83)	4th Qtr. ($000,000) Sales	% Chg ('83)	Earnings	% Chg ('83)
Bohemia	84.5	+12	-4.3	NM	40.4	-2	-3.2	NM
Boise Cascade	3820.0	+11	66.6	+15	907.1	+1	-24.5	NM
Chesapeake	350.2	+28	22.1	+77	76.3	+20	5.4	-17
Crown Zellerbach	2090.0	+15	86.9	-1	505.6	+11	10.3	-68
Georgia-Pacific	6680.0	+11	119.0	+40	1770.0	+15	-99.0	NM
Hammermill Paper	1855.0	+14	55.9	+72	500.0	+4	16.2	-12
Intl. Paper	4700.0	+7	120.0	-53	1100.0	0	-74.0	NM
Louisiana-Pacific	1230.0	+12	42.2	+51	283.8	-3	1.95	-72
Pope & Talbot	321.0	+14	-0.6	NM	79.1	+9	-4.7	NM
Potlatch	983.9	+10	49.6	+23	236.1	+1	10.0	-.1
Scott Paper	2847.0	+5	197.0	+51	747.2	-.4	49.9	+41
Southwest Forest	777.4	+22	4.1	-83	189.9	+19	-9.0	NM
Temple-Inland	1263.0	+8	102.7	+113	296.1	+3	25.7	+107
Union Camp	1974.0	+17	181.5	+37	477.6	+8	38.8	+6
Weyerhaeuser	5550.0	+14	226.2	+10	1407.0	+12	27.3	-61
Willamette Ind.	1182.0	+13	66.2	+197	298.0	+13	20.8	+618

NM = Not meaningful.

L-P's 1984 earnings jumped 51% to $42.2 million, thanks largely to good sales of pulp products and waferboard.

Over at Union Camp, where pulp and paper products are a mainstay, chairman and chief executive officer Peter J. McLaughlin exuded optimism: "The 1985 economic outlook remains positive. Our customers are enjoying good levels of business activity, which makes us confident that strong demand for paper products will continue."

Union Camp's 1984 profits jumped 37% to $181.5 million.

Write-offs related to building products operations turned profits to losses for both International Paper and Boise Cascade. IP wrote off $163 million before taxes in the fourth quarter, turning a $44-million profit into a $74-million loss. (Tax breaks resulting from the write-off reduced its true cost to about $118 million.)

But there was good news in the paper sector, IP noted: its operating profits tripled in 1984.

Writing off $88 million caused Boise Cascade to post a fourth-quarter loss of $24.5 million. Without those charges, the company said its profits would have shown sharp improvements. Boise wrote off a hardboard plant it closed, various consolidations in its wood products operations and $10 million to buy out some federal timber contracts.

Crown Zellerbach also bit the bullet in the fourth quarter and charged $30.1 million against profits to cover losses on timber-cutting projects and costs of restructuring its timber business. Fourth-quarter income fell 59% to $10.3 million. Annual profits dipped about 1% to $86.9 million. ■

Interest-rate fears detour homebuyers

SAN FRANCISCO, CALIF.—Some widely reported interest rates, such as the prime rate and Federal Reserve discount rate, have dropped in the past few months, but mortgage rates haven't fallen enough to stimulate homebuying.

Analysts say many potential buyers are waiting for mortgages to drop further. And builders are waiting for 1985's frequent blasts of "Siberian" air to stop before starting new projects.

The result is that homebuilding in the first half of this year is unlikely to keep up with the pace set in the first six months of 1984. Last year started off with a bang: the annual homebuilding rate even topped 2 million units briefly, and the period finished with an annual rate of 1.93 million.

That strength balanced later weakness in building to give 1984 an actual start rate of 1.74 million, 3% higher than 1983 and 2% above the forecasts for 1984. More typical of the last half of the year was December's homebuilding rate of 1.59 million units, which was pretty close to the rates recorded in November and October. December's annual rate of new building permits was also about 1.59 million. Actual starts in December totaled 96,800 units, slightly higher than the seasonal normal.

When decent construction weather returns to most of the U.S., builders will start working again, forecasts Data Resources Inc. The Massachusetts economic-analysis firm says 1985 should record 1.8 million housing starts. That would be the best year since 1978. ■

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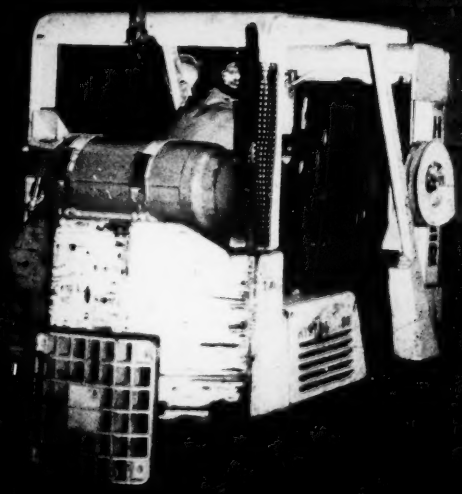
APRIL 1985

FOREST INDUSTRIES

LOGGING/PULPWOOD/FORESTRY/LUMBER/PANELS

1985 PANEL REVIEW



OSB plant's output exceeds design specs

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APRIL

Panel Review

1985 PANEL REVIEW

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Low prices, mill closures represent dark clouds on structural panel horizon. Particleboard, hardwood plywood groups certify HUD formaldehyde compliance

Another record year for structural panels

Atlanta, Georgia

Panel industry performance in the United States in 1983 was dominated by the structural panel segment of the industry, which for the second consecutive year set a production record.

The record of 21.968 billion ft² (⅜-in. basis) should stand at least through 1985, however. Forecasters see production easing to 21.6 billion ft², paralleling a moderation in housing starts this year. The 1984 record was 5.5% above 1983 production.

Three of the four other panel categories in this review also recorded production gains last year over 1983. The table below shows a 10-year history. In summary:

- Particleboard, an estimated 3.1 billion ft² (¾-in. basis), ahead of 1983 by 6.2%. The production record of 3.7 billion ft² was set in 1978.
- Medium density fiberboard, an estimated 650 million ft² (¾-in. basis), up 7.4% from 1983. This is a new record.
- Hardwood plywood, an estimated 1.3 billion ft² (surface measure), a gain of 0.8% from 1983.
- Hardboard, 6.8 billion ft² (⅛-in. basis), down 6.4% from 1983.

Estimates were provided by major trade associations where calculations of 1984 production were not yet complete.

Despite the increases and records, performance of domestic panel producers in 1984 reflected a moderation of the sharp production jump which took place in 1983. When the industry leaped out of the wood products recession in 1983, it turned in production levels ranging from 22% to 31% above 1982 marks in the five product categories.

Structural panels

If 1984 was another record production year, it also was the year of the so-called "profitless boom." An industry burdened by excess capacity found it difficult to recapture raw material and manufacturing costs at the low product prices forced by a surplus of production.

Thus in late months of the year and early in 1985, news of plant closures began cropping up, mostly in the West where high timber, labor and transportation costs relative to other regions put many installations firmly into the red. With the remaining mills producing at high rates of capacity, however, prices have not firmed.

The structural panel category is composed of the traditional softwood plywood plus the new kids on the block, non-veneered panels (waferboard and oriented strand board, mainly), which share performance standards and applications. Of 1984's nearly 22 billion ft² total, plywood accounted for just over 20 billion and non-veneered panels just under 2 billion.

The main thrust behind 1984 production was housing, observed American Plywood Assn. president William T. Robison. At 1.745 million units, housing starts were up 2.4% from 1983. Demand in other basic panel markets has also remained strong, Robison said.

Last year, panel use in housing increased 6% from 1983, contributing to a 41% share of the panel market. The remaining 59% of structural panel output went into non-housing markets: repair and remodeling, non-residential building, industrial uses and exports.

In 1985, look for a good first half and a downturn later, according to Robert G. Anderson, APA's director of market research and economic services. "Going into 1985, we had an excellent platform. Interest rates were down and mortgage rates were expected to moderate a bit further. The attitude is positive at both the builder and distribution level. Optimism for 1985 is solid."

Problems should surface later in the year, Anderson warned, as a continuing federal budget deficit puts the squeeze on credit.

The APA is forecasting 1.65 million housing starts and structural panel demand of 21.6 billion ft² in 1985. "Other markets will not quite offset the drop in

TABLE I—U.S. Panel Production, 1974-1984
(thousand ft²)

Year	Structural panels (⅜-in. basis)	Particleboard (¾-in. basis)	Hardboard (⅛-in. basis)	MDF (¾-in. basis)	Hardwood plywood (surface measure)
1974	15,677,381	3,103,800	6,056,542	—	1,544,343
1975	16,680,160	2,538,934	6,237,906	215,496	1,273,200
1976	18,440,000	3,002,225	7,066,022	250,038	1,493,119
1977	19,378,000	3,502,910	7,200,000	441,264	1,778,200
1978	19,564,000	3,720,286	7,300,000	503,416	1,481,271
1979	19,653,000	3,716,489	7,687,796	387,736	1,430,000
1980	18,464,000	2,848,897	5,140,000	493,140	1,210,000
1981	17,823,000	2,982,382	6,104,000	538,103	1,370,000
1982	16,402,864	2,991,068	5,586,918	446,167	1,289,000
1983	20,821,343	2,919,544	7,302,702	605,038	1,289,000
1984	21,967,917	3,100,000 (est.)	6,837,118	650,000 (est.)	1,300,000 (est.)

housing," Anderson noted, "although they will come close. Exports will be better. Non-residential construction will be as good, with increased promotion offering hope for more volume. Repair and remodeling will be up and industrial uses about equal with 1984."

Anderson suggested higher interest rates could push housing down to the 1.4 to 1.45 million range in 1986. However, an undersupplied housing market will create another demand surge by 1990, accompanied by increases in non-residential building and exports.

APA's promotion plan through 1989 has the goal of adding 4.5 billion ft^2 of new demand, which Robison termed "a conservative assessment of the new business that can be won largely at the expense of our industry's non-wood competitors.

"It's the amount of new demand we feel realistically can be added with the funds and manpower available to the industry over the next few years," Robison said.

Formaldehyde developments

Efforts of particleboard and hardwood plywood manufacturers have been focused on compliance with U.S. Department of Housing and Urban Development regulations, which as of Feb. 11, 1985, govern formaldehyde emissions in manufactured homes.

The Hardwood Plywood Manufacturers Assn. has devised formaldehyde emission inspection and property verification programs for hardwood plywood wall paneling housing and unfinished industrial panels.

"HPMA's laboratory in Reston, Va., carries out the two-hour desiccator test and the large-scale chamber test," described president Clark E. McDonald. "Seventeen inspectors conduct formaldehyde inspections at an average frequency of four times per month, except where production is less than 1.5 million ft^3 per month, in which case the average frequency is one inspection per month."

National Particleboard Assn. is serving as a grademark agency to certify compliance with the HUD rule. Executive vice president William H. McCredie said 26 mills are signed up for emissions certification. Testing at the mill by NPA field representatives is backed up by lab testing of samples.

The HUD rule permits 0.3 ppm of formaldehyde at 77° F, 50% relative humidity and 50% air change per hour. Figures are calculated at a loading ratio of 1.3 ft^2 of product per ft^3 of air, basically the floor area of a manufactured home cube.

About 10% of particleboard ends up in manufactured homes, McCredie said, but many mills are certifying all products through the HUD standard so they and component makers can avoid maintaining a dual inventory.

Hardwood plywood

HPMA's laboratory last year carried out 933 formaldehyde desiccator tests and 153 formaldehyde chamber tests. The lab also conducted 668 Type II interior glue bond tests, 577 ASTM E-84 25-ft tunnel furnace flamespread tests, 43 ASTM E-162 radiant panel flamespread tests, 22 ASTM E-648 flooring radiant panel tests, and 47 ASTM E-662 smoke analyses.

To promote exports, HPMA will join four other hardwood associations in an exhibit at Interzum, the biennial furniture show in Cologne, West Germany, May 8-14 and will publish a German language edition of the 1985 HPMA directory. HPMA will also take a group of its members to Tokyo Nov. 18-20 for the 9th Asian Plywood Manufacturers Conference, followed by a plywood and veneer mill study tour in Indonesia.

The HPMA staff chief explained the domestic industry's concern about hardwood plywood imports. Japan, the largest exporter of hardwood plywood to the U.S. 25 years ago, and Korea, which held that position 15 years ago, both depended on logs imported from the Philippines, Indonesia and other countries on the Pacific Rim.

"Within the last five years, Indonesia has become the largest hardwood plywood exporter to the U.S. In 1980 they had 29 hardwood plywood mills with an installed capacity of 1,949,000 m^3 (two shifts). In 1984 they had 95 hardwood plywood mills with an installed capacity of 5,327,600 m^3, McDonald said.

"In 1985 they will have 198 hardwood plywood mills with an installed capacity of 5,830,000 m^3. The Indonesian Wood Panel Assn. (APKINDO) estimates 1985 production at 4,081,000 m^3, domestic sales of 756,000 m^3 and exports of 3,325,000 m^3.

"Indonesia has imported no hardwood plywood since 1980, and their government will not allow logs to be exported. Taiwan has been the big exporter of door skins to the U.S.; however, Taiwan does not have a hardwood forest resource. Indonesia has begun to manufacture door skins and will probably become the principal supplier of skins to the American flush door industry."

Particleboard and MDF

McCredie described cabinet and furniture markets as strong. These and other industrial uses account for about 70% of particleboard production. "This helps isolate us from the general doldrums of the construction marketplace," he said. NPA will be emphasizing further promotion to these markets.

Basically, he summarized, order files are looking good and manufacturers expect 1985 performance similar to 1984 levels. ■

Waferboard paces Canadian industry

VANCOUVER, B.C.—Canada's panel industry had a mixed year in 1984, with the big news another spectacular leap in waferboard output which pushed the figure beyond one million cubic meters for the first time.

Particleboard production also moved upward, while softwood plywood and hardboard figures declined. (Canadian statisticians do not mingle waferboard and OSB with structural plywood as do U.S. industry sources, but OSB is combined with waferboard.)

Here are the 1984 production numbers provided by Statistics Canada (one cubic meter equals 35.3 cubic feet):

- Waferboard, 1,190,254 m^3, a gain of 37.8%.
- Particleboard, 843,346 m^3, increasing 17.5%.
- Softwood plywood, 1,846,369 m^3, a decline of 10.5% from 1983.
- Hardboard, 160,855 m^3, down 5.6%.

The increase in waferboard production came atop a 1983 jump of 75% over the year before. Output was 492,447 m^3 in 1982 and 863,442 m^3 in 1983.

The softwood plywood drop in 1984 reversed a substantial 23% increase recorded in 1983.

Most Canadian softwood plywood is made in British Columbia, where mills operated at about 90% of capacity in 1984. Production declined by 12% to 1.754 billion ft^2 (⅜-in. basis), according to the Council of Forest Industries of British Columbia.

COFI blamed a sharp reduction in Canadian housing starts, the strength of the Canadian dollar internationally and a period of intermittent, labor-related production curtailments.

"However, 1984 production is still substantially above the extreme low of 1982," said Art Kempthorne, plywood sector manager for COFI. "Mills have made major improvements in production technology and productivity."

B.C. plywood exports to Europe increased last year. Higher export volumes to Japan and other new market areas were scored, and the B.C. industry is studying opportunities in China. ■

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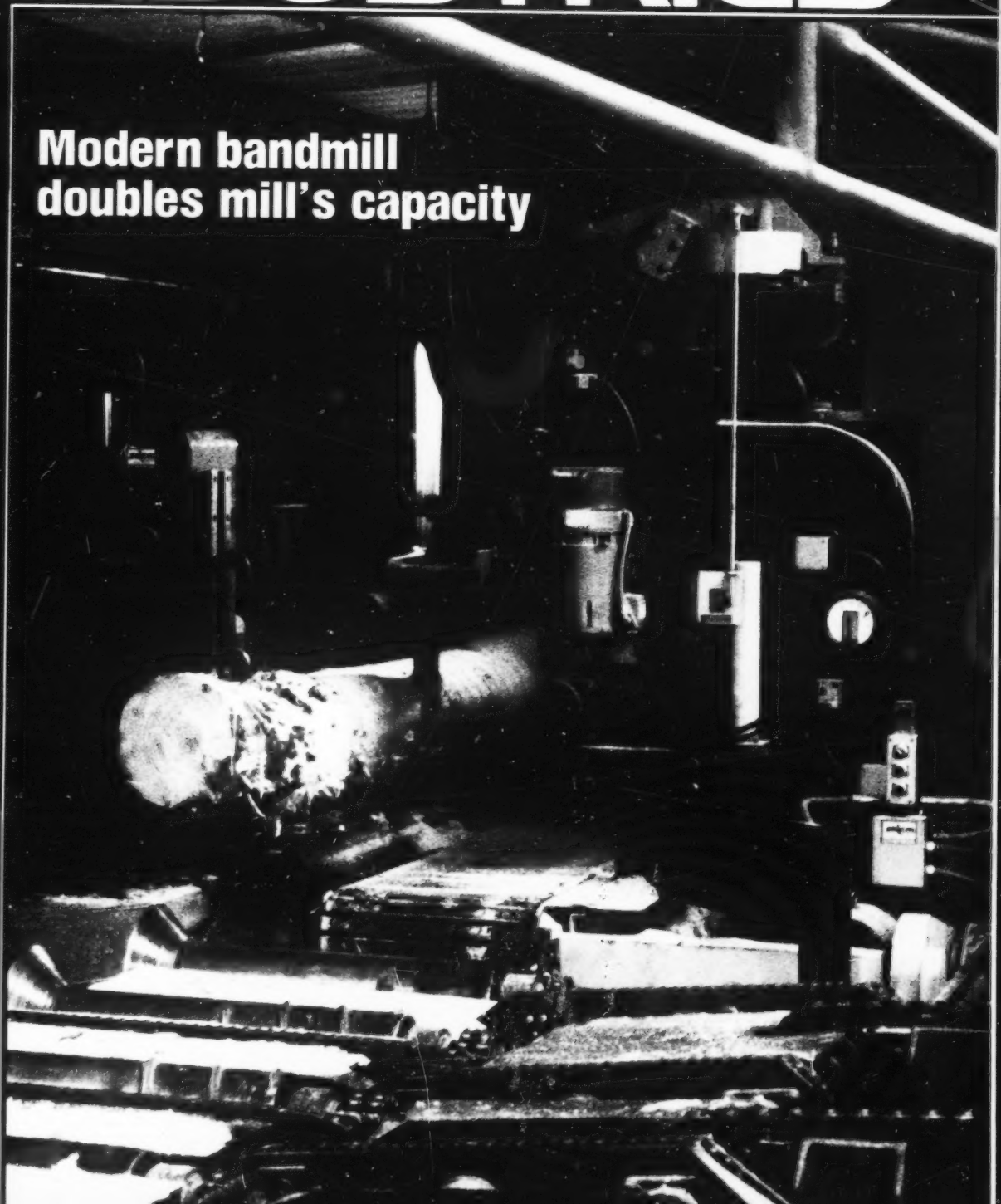
MAY 1985

FOREST INDUSTRIES

LOGGING/PULPWOOD/FORESTRY/LUMBER/PANELS

Modern bandmill doubles mill's capacity



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Solid-wood sales contributed little to good financial performance of integrated companies in 1984; paper markets were lively

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Versatile new line makes thinboard and thick board
Waferboard Corp., located in Timmins, Ont., is known as one of Canada's most progressive panel manufacturers. Family influence is strong

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Solid-wood sales contributed little to good financial performance of integrated corporations in 1984, which otherwise responded positively to lively paper market

Low prices depressed '84 corporate earnings

By David A. Pease

Atlanta, Georgia

Conventional wisdom as applied to 1984 financial performance of North American forest products corporations infers that successful profit levels were tied to the degree of integration into pulp and paper manufacture.

"Newsprint and coated paper were the exceptions in a year when markets for forest products were generally difficult." This masterpiece of understatement, on the cover of the British Columbia Forest Products Ltd. annual report, was an appropriate summary of the situation in the United States and Canada.

A year that generated record sales and earnings figures for several companies was also tagged as producing "profitless prosperity" for solid-wood producers. Demand continued to soar but excess lumber and plywood manufacturing capacity on both sides of the border held prices down.

Economic and political fallout has occurred:

- Activity to buy out of federal timber contracts following passage of contract termination legislation.
- Closure of many western sawmills and plywood plants, causing a spate of inaccurate rumors suggesting that the western industry is dead. (Vaudeville is dead. Chivalry may be dead. The industry in the West is not dead.)
- Movement by many corporations to sell, and by some others to buy, timberland, as a means of removing undervalued assets from the books and concentrating fee simple ownerships within economic reach of mills.
- Increased acrimony over Canadian lumber shipments into the U.S.

The first three items above have generated a substantial number of fourth-quarter writeoffs for past and projected losses, mill shutdowns for the most part, affecting earnings for the year.

Charting the numbers

The accompanying tables are based on sales and earnings as reported by the corporations, including the writeoffs, etc., and thus do not in all cases indicate performance of continuing operations.

The tables list a number of corporations heavily or wholly involved with manufacture of paper products as well as major integrated and solid-wood producers, to help illustrate relative financial strength. This expansion of our more traditional horizons recognizes also that we have a lively constituency of readers in the pulpwood industry, who are more appropriately concerned with the performance of paper companies than with housing starts.

Georgia-Pacific Corp. led the 1984 sales parade at nearly $6.7 billion and Weyerhaeuser Co. was at the top of the earnings column at $226 million. Both firms derived just under half their sales last year from solid-wood products. Seven companies were in the "top 10" in both categories and 16 corporations were on both "top 20" lists (see tables).

Most fourth-quarter writeoffs, pretax and after-tax charges for mill closures and timber contract buyouts have been reported in previous issues. They include: International Paper Co., $163 million; Georgia-Pacific, $160 million; Champion International Corp., $150 million; Boise Cascade Corp., $88 million; Weyerhaeuser Co., $44 million; Crown Zellerbach Corp., $30.1 million; Louisiana-Pacific Corp., $22.1 million; Southwest Forest Industries Inc., $10 million; and Willamette Industries, $5.2 million.

Where such charges were taken, adjustment of 1984 figures to reflect continuing operations would show better earnings than the numbers stated, and in the case of Champion International would erase the loss reported and replace it with earnings of $139 million. (Champion's numbers were jackstrawed further by its acquisition of St. Regis Paper Co. during the fourth quarter, which created a variety of additions and subtractions.)

Louisiana-Pacific broke the aforementioned rule relating profits to paper, incidentally: sales were up 12% and net income up 51% over 1983 in a year when building products represented 83% of total sales.

While earnings of Canadian corporations were generally improved over 1983, the industry's profit margin there was low. Western companies producing solid wood and market pulp suffered a one-two punch from two bad markets. Market pulp sales offshore suffered from a strong Canadian dollar relative

Canadian forest products corporations
1984 sales and earnings vs. 1983
(as reported, before adjustments, in millions of dollars, Canadian)

Company	Sales	Chg (%)	Earnings	Chg (%)
Abitibi-Price Inc.	2137.2	+29	70.1	+65
B.C. Forest Products Ltd.	1014.7	+13	9.2	NM
Canadian Forest Products	1029.5	+3	-28.3	NM
CIP Inc.	1476.0	+22	-11.7	NM
Consolidated-Bathurst Inc.	1623.0	+17	58.9	+137
Crestbrook Forest Industries	137.9	+9	0.9	NM
Crown Forest Industries Ltd.	740.8	+2	-4.9	NM
Domtar Inc.	2044.3	+12	89.5	+119
Donohue Inc.	438.6	+23	30.3	+222
Fraser Inc.	529.5	+21	3.5	-67
Great Lakes Forest Products	602.0	+22	17.8	NM
MacMillan Bloedel Ltd.	2127.6	+4	19.3	-19
Westar Timber Ltd.	361.4	+7	-3.6	+67

(NM—Not measurable)

to most foreign currencies and severe competition from Scandinavian producers.

Big, integrated corporations in eastern Canada were better positioned for profits with a product mix including newsprint and fine printing papers.

Circling the wagons

Not long ago, corporations were racing to diversify their interests into non-wood fields through acquisition of other companies. That trend has reversed, and now involves stepping back toward the traditional forest resource base through sale of unrelated divisions and subsidiaries. Georgia-Pacific sold its commodity chemical operations for $262 million in cash and securities, as but one example. "Asset review" is a term that appears frequently.

"We are concentrating our resources on businesses that we know and understand, with emphasis on segments that can perform in a superior manner," observed William T. Creson, Crown Zellerbach's chairman, president and CEO, at a recent security analysts' meeting in San Francisco.

Thus the integrated corporations have invested heavily in capital projects under the pulp and paper umbrella, but most capital investment on the solid-wood side of the industry has come from a very shallow purse. The most notable exceptions are the non-veneered structural panel plants being built in numbers by Georgia-Pacific and Louisiana-Pacific.

The year also saw persistent attempts by overseas interests to gain ownership of U.S. corporations.

- British financier Sir James Goldsmith, after failing to acquire St. Regis Paper Co. bid unsuccessfully last June for Continental Paper Inc., was rumored in September to be accumulating Owens-Illinois Inc. stock (blocked by a special issue of preferred stock) and by March 1985 had purchased an 8.6% interest in Crown Zellerbach.
- Jefferson Smurfit Group Ltd., an Ireland-based papermaking concern, bought 9.3% of Southwest Forest Industries stock in May 1984 but merger plans were terminated in July.
- Australian Rupert Murdoch, whose publishing empire spans three continents, purchased 5.6% of St. Regis in June before a takeover bid the following month was rejected. In August, St. Regis accepted a bid from Champion International to buy 60% of its shares for $1.84 billion.

The capacity overhang

Western mill closures as a quick cure for industry overcapacity and poor profits constitutes a subject essential to any review of corporate financial performance in 1984.

Euphemisms include "readjustment" and "realignment." Western mills have been most vulnerable to closure as timber and labor costs compare unfavorably with the South, and many mills are old and to some degree obsolescent.

A year that generated record sales and earnings figures for several companies was also tagged as producing 'profitless prosperity' for solid-wood producers

Efficiency, or lack thereof, was not a universal yardstick, however. Prominent among closures was International Paper's Gardiner, Ore., sawmill, recently rebuilt to high-tech standards at a cost upward of $40 million.

Boise Cascade, Champion International, Weyerhaeuser, Potlatch and Crown Zellerbach were among other big names on the list of western mill shutdowns.

Closures to "adjust" industry capacity also meant, as one corporate official remarked privately earlier in the year, that the money guys have seized control of important corporate decisions from production people. Bankers or corporate financial officers, depending on cases, have declared the companies simply can't afford to make lumber and plywood in their expensive-to-run western mills.

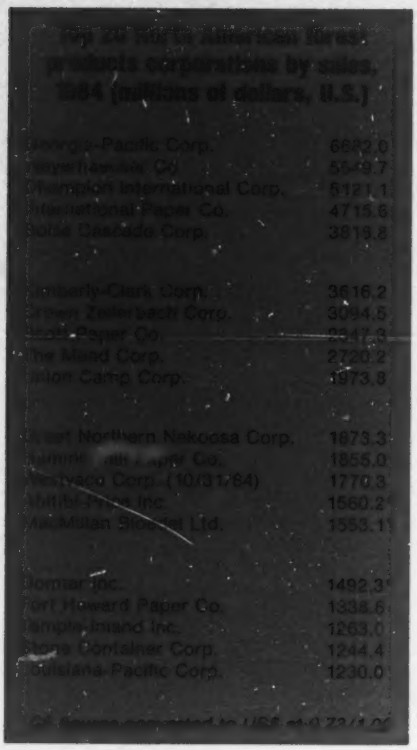
Portland, Ore., economist Daniel L. Goldy agrees. "Why are so many mills shutting down? Why are the closures particularly concentrated among the big companies? The easy answer, of course, is that companies shut down their mills when they lose money or are not obtaining a sufficient return on their investment," he said March 19 at the 1985 Economic Outlook Conference in Portland.

"Big companies, with mills and profit centers in other parts of the U.S. and Canada, don't have to stay in the Pacific Northwest and suffer. They can shut

U.S. forest products corporations
1984 sales and earnings vs. 1983
(as reported, before adjustments, in millions of dollars, U.S.)

Company	Sales	Chg (%)	Earnings	Chg (%)
Bohemia Inc.	84.5	+12	-4.3	NM
Boise Cascade Corp.	3816.8	+11	69.6	+15
Bowater Inc.	887.7	+17	72.1	+90
Champion International Corp.	5121.1	+20	-6.0	NM
Chesapeake Corp.	350.2	+28	22.1	+77
Consolidated Papers Inc.	686.3	+20	80.6	+64
Crown Zellerbach Corp.	3094.5	+15	86.9	-1
Federal Paper Board Co.	637.4	+12	37.1	+197
Fort Howard Paper Co.	1338.6	+70	133.1	+24
Georgia-Pacific Corp.	6682.0	+11	119.0	+13
The P.H. Glatfelter Co.	310.9	+21	63.2	+207
Great Northern Nekoosa	1873.3	+20	119.9	+43
Hammermill Paper Co.	1655.0	+14	55.9	+72
International Paper Co.	4715.6	+8	120.1	-53
Jefferson Smurfit Corp.	678.1	+13	24.5	+143
Kimberly-Clark Corp.	3616.2	+10	225.0	+19
Louisiana-Pacific Corp.	1230.0	+12	42.2	+51
The Mead Corp.	2720.2	+15	139.3	+227
Mosinee Paper Corp.	200.2	+55	8.9	+24
The Pacific Lumber Co.	280.7	+17	44.6	+57
Pentair Inc.	545.4	+71	21.2	+78
Pope & Talbot Inc.	320.8	+14	-0.6	NM
Potlatch Corp.	993.9	+10	49.6	+22
Scott Paper Co.	2847.3	+5	187.0	+51
Sonoco Products Co.	740.9	+11	42.5	+27
Southwest Forest Industries	777.4	+22	4.1	NM
Stone Container Corp.	1244.4	+90	33.7	+1062
Temple-Inland Inc.	1263.0	+7	102.7	+113
Union Camp Corp.	1973.8	+17	181.5	+37
Westvaco Corp. (10/31/84)	1786.3	+18	130.0	+107
Weyerhaeuser Co.	5549.7	+14	226.2	+10
Willamette Industries Inc.	1181.9	+13	61.0	+174

(NM—Not measurable)



down operations here and continue to operate from their other facilities where conditions are more favorable," Goldy said.

Does padlocking a mill actually reduce industry capacity, or is the facility just waiting to be re-opened in better times? "A plywood mill is a plywood mill until you scrap it," declared Bernard E. Fuller of Data Resources Inc., Lexington, Mass., during the recent Particleboard/Composite Materials Symposium at Washington State University. "That capacity remains on the books until the mill is burned and the machinery is melted down." The laughs were forced.

Closures, whether temporary or for real, do not mean the industry is giving the West to the environmentalists and the state unemployment agencies. Not on your Uncle Sven's misery whip. Emerging from the confusion following the late-1984 and early-1985 shutdowns are these considerations:

• Look for new names and faces to surface. A few business-oriented entrepreneurs are collecting bankrupt mill assets at fire-sale prices and building small-scale, multi-plant operations.

Capital costs are far below replacement value, creative compensation and work-rule programs provide an alternative to union organization, and timber purchases can be approached without inheriting overbid national forest contracts.

Thus with break-even points targeted lower than they were for previous owners, there is elbow room to upgrade, run below capacity and/or experiment with specialized products and market segments.

• Existing independent western companies will assume a stronger position. Without the option of shifting operations to a timber and manufacturing base elsewhere, these corporations have to fish or cut bait on the basis of resource and economic conditions as they exist in the West. It will be rough going for a while, but don't for a moment count out the Bohemias, Willaminas, Pope & Talbots, Gilchrists, Fourplys and others of similar scale.

Look also for companies in this category to ride point in the area of manufacturing and process control innovation. They have the financial resources and the incentive. With comparatively fewer options open, production efficiency rises on the profit priority list.

Goldy's comments: "The smaller companies—the so-called independents—don't have that luxury (of moving). They either operate here, where their *only* plants are located, or they don't operate at all. Consequently, the smaller companies tend to fight harder to stay alive, invest more in the newest technology to become more competitive, and yell louder at the extra burdens placed on them by an unthinking or uncaring federal bureaucracy."

• Long-term corporate strategy considers the timber resources of the West as essential. Big corporations may appear somnolent in the West, but as Andy Capp might have told Flo when she interrupted his nap on the living room couch: "I'm not sleeping, I'm just bunching my muscles."

Corporate leaders recognize the immense volume of fiber contained in western forests, and the concentration of high-grade timber. A variety of observers have suggested that distribution of raw material sources, manufacturing facilities and market areas will eventually equalize nationally. In the meantime, unfortunately, the short-term displacement will bring increased unemployment and depressed economies to western communities historically dependent on mill and logging jobs.

"If you can survive for another five years, things should look better," L. L. Stewart, chairman of Bohemia Inc., remarked during a workshop at the recent FOREST INDUSTRIES Clinic and Machinery Show in Portland, Ore. He cited Western Wood Products Assn. figures that show an estimated 650 sawmills operating in the region at the end of 1984, versus 818 in 1979. "However, due to gains in productivity, lumber production capacity is estimated to be the same as in 1979," Stewart said.

"We cannot undo the technology. The capacity is here and the plants are in place," observed Peter Vajda, president of Columbia Engineering International Ltd., at the WSU Particleboard/Composite Materials Symposium. "We might as well confess our sins of being too successful."

The swinging pendulum

According to Goldy, prosperity will return to the forest products industry in the West because Canada and the South are cutting out their resources.

"In B.C., it is estimated that a 30% cutback in harvest will occur by about 1990, and most of the other Canadian provinces are in as bad shape or worse," Goldy asserted. "In the South, for every 10 acres of southern pine timber harvested, on the average only one is replanted. Two or three acres may naturally restock to pine, but six to seven of that 10 acres is replaced by brush or scrub hardwoods."

Goldy predicted such practices will bring significant harvesting cutbacks sometime during the 1990s.

"Looking down the road, the Pacific Northwest is going to be the major source of softwood timber to meet the country's needs. The bulk of our forest resource is on a sustained-yield basis, and, if anything, it is being underharvested by the Forest Service." Industry timberland in the West, overcut in recent years, faces a 15 to 20-year gap before new growth reaches merchantable size, Goldy said.

The problem, Goldy continued, is that about 75% of merchantable timber in the West, owned by the federal government, is managed "by bureaucrats in Washington, D.C., who make the big decisions and leave it to their regional representatives to implement them and take the heat."

There are good arguments to be made that the South isn't in as bad shape as Goldy contends, although a region-wide harvest/reforestation imbalance is acknowledged. Mills are well-situated to serve major market areas, the immense southern pine forest resource continues as the focus for industry lumber and plywood expansion, and hardwood forests east of the Great Plains have fueled an all-new industry sub-section—waferboard and oriented strand board.

Setting aside for the moment the huge pulp and paper industry in the South and concentrating only on saw-log-quality timber, however, one begins to appreciate the long-term value of western forests to the industry.

In the South, industry and landowners alike continue to wrestle with the means of unlocking the potential of non-industrial private forest lands. The quick-rotation pine plantations of forest products corporations are directed at feeding the appetites of pulp and paper mills, with sawlogs a high-grade by-product of tree-length merchandisers and simple in-woods sorting operations.

As in the West, diminishing natural stands remain the basis for sawlog and peeler log supply. Development of yet more efficient small-log lumber and veneer systems will intensify the competition for pulpwood, driving up raw material prices and altering utilization patterns.

Efficiency: two-edged sword

As noted elsewhere in this article, improvements in production efficiency have increased capacity at a rate which has more or less offset lumber and plywood mill shutdowns. Yet continued improvements in productivity and product yield represent a bicycle the industry must pedal faster and faster in order to remain upright.

"A good many of the survivors made some strategic management moves during that (1980-82) recession period," said William A. Whelan, president and CEO of Pope & Talbot Inc., at the Economic Outlook Conference in Portland. "They shored up their productivity. They did so well, as a matter of fact, that we are now almost certain that the western lumber producing capacity in 1985 exceeds our capacity of those days of halcyon markets in 1978.

"We're not even sure what our true capacity is, and we won't until it is tested. Boy, would we like to see it tested!"

Individually, mill owners producing commodity items must go high-tech to survive. Collectively, this exacerbates the overcapacity problem.

"We must embrace the new technologies that improve our capabilities for product quality control. We must use scanning, predetermined sawing programs and new sawing techniques to extract the maximum value from every log. A few years ago it would have been laughable to talk of sawing accuracies in thousandths of an inch. Today, it's mandatory for survival," Whelan stated.

Rust, a friend once remarked of his English car, never sleeps. In today's context, neither does technology. Despite the unsettling aspect of mill closures, the West remains a good prospect for high-tech modifications.

Products: more are better

Within the solid-wood segment, the more successful companies financially were those not restricted to one or two basic products. Examples from annual reports indicate non-veneered construction panels, high-value plywood and panel specialties, and treated southern pine lumber are three bonus categories.

"The earnings strength of our building products group lies in product diversity. We are not dependent on lumber and plywood, for instance, as are many of our competitors."—Temple-Inland Inc.

"We continued to improve the efficiency of our use of timber resources by expanding production and distribution of oriented strand board and waferboard for commodity uses such as roof and floor decking and sidewall sheathing and converting the production of our plywood plants to higher-margin specialties."—Georgia-Pacific.

"The attractive profit margins of Waferwood (brand waferboard), industrial particleboard, MDF and hardboard contributed to good profits in other panel products in 1983 and 1984. In 1984, Waferwood profits were bolstered by improving the product's configuration and increasing its stress rating. This new 'oriented' Waferwood product commands a higher price since the product is now more versatile."—Louisiana-Pacific.

"Chesapeake's lumber shipments increased 77%, due primarily to the expansion of our treated pine and hardwood lumber operations. Chesapeake is committed to increasing the production of wood products in its operating area to maximize the value-added potential of available wood."—Chesapeake Corp.

"Oriented strand board (Oxboard) shipments out of Minnesota were 45% ahead of 1983, helping to mitigate a 15% decline in plywood and veneer shipments for the year. One of the brighter spots in an otherwise difficult year for wood products was the operating performance of the Minnesota oriented strand board plants."—Potlatch.

The year in review

Here are some baseline statistics: Softwood lumber consumption in the U.S. last year totaled a record 42.758 billion bd ft, of which U.S. mills produced 30.791 billion bd ft. Structural panels (softwood plywood, waferboard and oriented strand board) also set a production record at 21.968 billion ft^2 (⅜-in. basis). Housing starts totaled 1,753,500 units.

For 1985, U.S. trade associations project softwood lumber consumption

will rise slightly to 42.948 billion bd ft, production will follow at 31.349 billion bd ft, structural panels will slide to 21.6 billion ft^2, and housing starts will fall to the 1.65 to 1.75 million area.

Annual reports take up the year's chronicle:

"Early in the year, anticipating a favorable market, sawmills produced at high rates, and the distribution network accumulated inventories. But in the spring, rising interest rates and prolonged cold, wet weather discouraged builders, causing an abrupt inventory correction and a sharp break in prices. Meanwhile, Canadian producers, spurred by the strong U.S. dollar and aided by low-cost government timber, flooded the U.S. market and captured 31% of volume (up from 19% ten years ago)."—Southwest Forest Industries.

"By May, it had become apparent that production capacity had expanded very rapidly during the previous five years, and that, even with moderately strong activity in housing, commodity lumber and plywood capacity now far exceeded demand. Prices dropped back, and remained at depressed levels through the rest of the year, with only moderate improvement at year's end."—Weyerhaeuser.

"Without a significant change in the level of housing starts and without government action to limit Canadian lumber imports, we do not foresee a meaningful improvement in market conditions that would warrant the continued operation of all our wood products facilities."—International Paper. ■

Japan's tariff structure has caused considerable industry outcry, but it is not the only reason for a U.S. trade deficit with Japan. Other obstacles exist

Can U.S. expand forest products exports to Japan?

By Roger A. Sedjo

Washington, D.C.

In January 1985, President Reagan and Japan's Prime Minister Nakasone met in Washington, D.C., to discuss issues of common concern. At that meeting, President Reagan listed four priority areas where the U.S. is a highly competitive producer but believes it is denied full access to Japanese markets: telecommunications, computers, drugs and medical equipment, and forest products.

Forest products have made great progress in getting on the political agenda. Just two years earlier, following the first Reagan-Nakasone meeting in Washington, the newly formed U.S.-Japan Advisory Commission was charged with examining a wide array of issues, including bilateral trade. Initially, forest products trade was not even considered. It was only after the Commission learned that U.S. forest product exports to Japan are substantial—now running about $2.5 billion annually (compared with $6.5 billion in U.S. agricultural exports), with about $1.9 billion in solid wood products and another $0.6 billion in pulp and paper products—that forest products became an area of major interest.

To understand the issue, one must understand the structure of Japanese international trade, particularly imports. There is general awareness that Japan is a resource-poor country. As such, its basic *modus operandi* in the period since World War II has been to import natural resources which are processed and either consumed domestically or exported to generate earnings, which are then utilized to finance additional resource imports.

To a large extent, the same trading pattern has existed in forest products except that, for the most part, Japanese exports of processed forest products have been minor. Most of the products have been consumed domestically.

This pattern is not particularly surprising. Japan is a relatively heavily forested country. Historically, Japan drew from those forest resources to meet domestic wood needs. Even today, about 40% of the wood processed by the Japanese economy originates in Japan.

In the early postwar period, Japan found that foreign wood supplies in the form of logs could supplement its domestic resources. Initially, the foreign supplies were from the Philippines and other Asian-Pacific countries. By the mid-1960s, the U.S. and the USSR both were becoming major suppliers of logs.

During this period, Japan continued to develop its wood processing industry. Japanese wages were low in the early postwar period, and many forest products require labor-intensive production processes. However, after the onset of much higher wages in the 1970s, this policy came under serious question.

Japan imports massive quantities of logs and wood chips (Table 1). For these categories of raw wood, Japanese imports account for between 45% to 83% of total world imports. By contrast, for most processed products, Japan accounts for 10% or less of world imports.

The U.S. is a major exporter of both processed and unprocessed wood to Japan, accounting for almost 50% of the country's softwood log imports and over one-third of its chip imports (Table 2). Overall, the U.S. accounts for about one-fourth of Japanese imports of unprocessed wood. The U.S. is also a major source of Japanese imports of processed solid wood, accounting for about 18% of total Japanese imports. However, since Japanese import levels are relatively modest, the total volumes of U.S. processed goods are small.

Exporting to Japan involves four types of obstacles: 1) tariffs, 2) nontariff barriers, 3) differences in standards, and 4) institutional or "invisible" barriers.

In recent years, two important rounds of trade negotiations have taken place: the Kennedy Round (1963-1967) and the Tokyo Round (1973-1979). The result of these two rounds was the virtual elimination of tariffs on most solid wood products, with the notable exception of wood panels and veneers. In wood panels, the Japanese have tenaciously resisted reducing tariffs that protect an already depressed industry. On the pulp

TABLE 1—Japan's share of major world wood products imports, 1980

Product	World volume imports	Japan's volume imports	Japan as % of world
Solid wood (1000 m³)			
Chips and particles	19,153	15,936	83.2
Sawlogs, conifer	27,930	17,172	61.5
Sawlogs, nonconifer	42,178	19,202	45.5
Pulpwood	19,922	1,136	5.7
Sawnwood, conifer	62,801	4,892	7.8
Sawnwood, nonconifer	12,702	555	4.4
Veneer sheets	1,760	111	6.3
Plywood	5,908	113	1.9
Particleboard	5,716	75	1.3
Fiberboard	2,014	3	0.1
TOTAL	200,084	59,195	29.6
Fiber (metric tons)			
Newsprint	12,721	127	1.0
Pulp	20,410	2,206	10.8
Paper, paperboard	38,230	800	2.1
TOTAL	71,361	3,133	4.4

SOURCE: Food and Agricultural Organization of the United Nations, "Yearbook of Forest Products Statistics," 1981, Rome.

TABLE 2—Japanese market for selected wood products and U.S. participation, 1980

Product	Total Japanese consumption (million US$)	Total Japanese imports (million US$)	Total Japanese imports as % of consumption	U.S. exports (million US$)	U.S. share of Japanese imports (%)	U.S. share total Japan consump. (%)
Unprocessed						
Softwood logs	5,405	2,727	50.5	1,291.0	47.3	23.9
Hardwood logs	3,577	2,968	83.0	10.0	0.3	<0.01
Chips	1,767	951	58.9	359.0	37.7	20.3
TOTAL	10,749	6,646	62.7	1,660.0	25.0	15.4
Processed						
Softwood lumber	7,546	1,038	13.8	221.0	21.3	2.9
Hardwood lumber	2,447	188	7.7	9.0	4.7	<0.01
Plywood	6,000	33	0.5	2.0	6.1	<0.01
Veneer (total)	N.A.	25	N.A.	0.6	2.4	N.A.
Softwood	N.A.	N.A.	N.A.	0.2	N.A.	N.A.
Hardwood	N.A.	N.A.	N.A.	0.4	N.A.	N.A.
Particleboard	200	14	7.0	5.0	35.7	2.5
TOTAL	16,193	1,298	8.0	237.6	18.3	1.5

Japanese plywood figures are for both hardwood (now almost entirely) and softwood plywood.

SOURCE: United Nations Food and Agricultural Organization for Japanese statistics; and U.S. Department of Commerce for U.S. statistics.

and paper side, the tariffs have been reduced but are pervasive.

The Japanese tariff structure is characterized by "escalation." The higher the degree of processing, the greater the tariff or other restrictions. It should be noted, however, that escalation is a fairly common practice and is not unique to forest products or to Japan.

Aside from tariffs, a variety of nontariff barriers exists. These include restrictions that are designed to limit imports, e.g., prohibitions or quotas, or restrictions aimed at health or sanitary considerations. It is often difficult to determine the real purpose of some of the restrictions.

Examples of these include the Japanese lumber sorting requirements of the 1970s, whereby all imported lumber was resorted and regraded, and the more recent restriction of plywood due to "white pocket." The resorting practice was discontinued in the late 1970s by mutual agreement. "White pocket," a blemish found on plywood made from old-growth Douglas fir, caused the plywood to fail to meet Japanese standards even though it was structurally adequate. This difficulty has been resolved by a mutually agreed upon adjustment in this standard.

Other differences in standards and tastes have resulted in restricting imports. For example, Japanese housing construction uses a post and beam approach that is quite different from the North American platform frame construction technique. The different construction techniques result in different lumber standard requirements.

The Japanese technique also puts a premium on the color of the wood (white wood is preferred), its freedom from knots and other defects, and the aesthetic quality of the wood grain. Much of the lumber used for residential construction in Japan is custom-sawn by the mill.

For plywood, there are differences in the standard panel size, with the North American size being 4x8, while the Japanese standard is 3x6. For some paper products there are differences in the shade of color of imports that are less preferred by the Japanese.

In addition to the above restrictions, there are barriers of an institutional nature that limit the degree to which imports can penetrate Japan's market. For example, the Japanese distribution system is extremely difficult and complex, and the inability to move imported, processed products into that system restricts imports. The traditionally close relationships between producers, distributors and banks tend to exacerbate the difficulties of access to the distribution system and act as an "invisible barrier" to import penetration.

More generally, the Japanese have a tolerant view toward firm cooperation and cartelization, particularly for distressed industries. Japanese importers' associations, which sometimes function to maintain "orderly markets," clearly can be an impediment to imports. The 1979 "depresssed industries law," which allows for cartelization of struggling industries accompanied by various governmental subsidies, can further deter foreign competition.

The effects of these arrangements on forest products imports are likely to be substantial since at least three forest products categories are officially classified as depressed: plywood, corrugated cardboard and lumber (regionally). For these industry groups, both subsidies and subtle forms of import limitations are likely to be exercised.

The question is, suppose tariff and other artificial barriers were removed—how much difference would it make? Overall, the effect would probably be modest. Clearly, trade restrictions are only part of the overall problem of a U.S. trade deficit with Japan. For example, the strong dollar also surely inhibits U.S. exports.

Nevertheless, the potential in some wood products groups could be significant. Japan is one of the world's leading wood-using economies. Japanese wood panel imports in particular would likely be substantial in the absence of the tariff and other restrictions. Also, U.S. pulp and paper export prospects appear increasingly favorable as the Japanese competitive position in a number of products continues to erode.

Taking the long-term view, the Japanese comparative advantage in both solid wood processing and in paper and pulp production has declined and will probably continue to do so. Given that this is the case, how might Japan be expected to respond? Two points are worth noting:

1. In the early postwar period, the Japanese tended to be pragmatic and to adopt policies that allowed orderly retreats and thereby gradual shifts out of declining industries.

2. As represented by the "depressed industries act" of 1979, in recent years this process seems to have been replaced by a policy of long-term retrenchment and protection of declining industries.

In this context, the U.S. needs to continue pressing Japan to further open these markets to foreign imports—especially those industries which are depressed and in which Japan must acknowledge a competitive disadvantage. To that end, perhaps the best initial objective is the further reduction of tariffs on all forest products with a follow-up objective of reducing the nontariff barriers. ■

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JUNE 1985

FOREST INDUSTRIES

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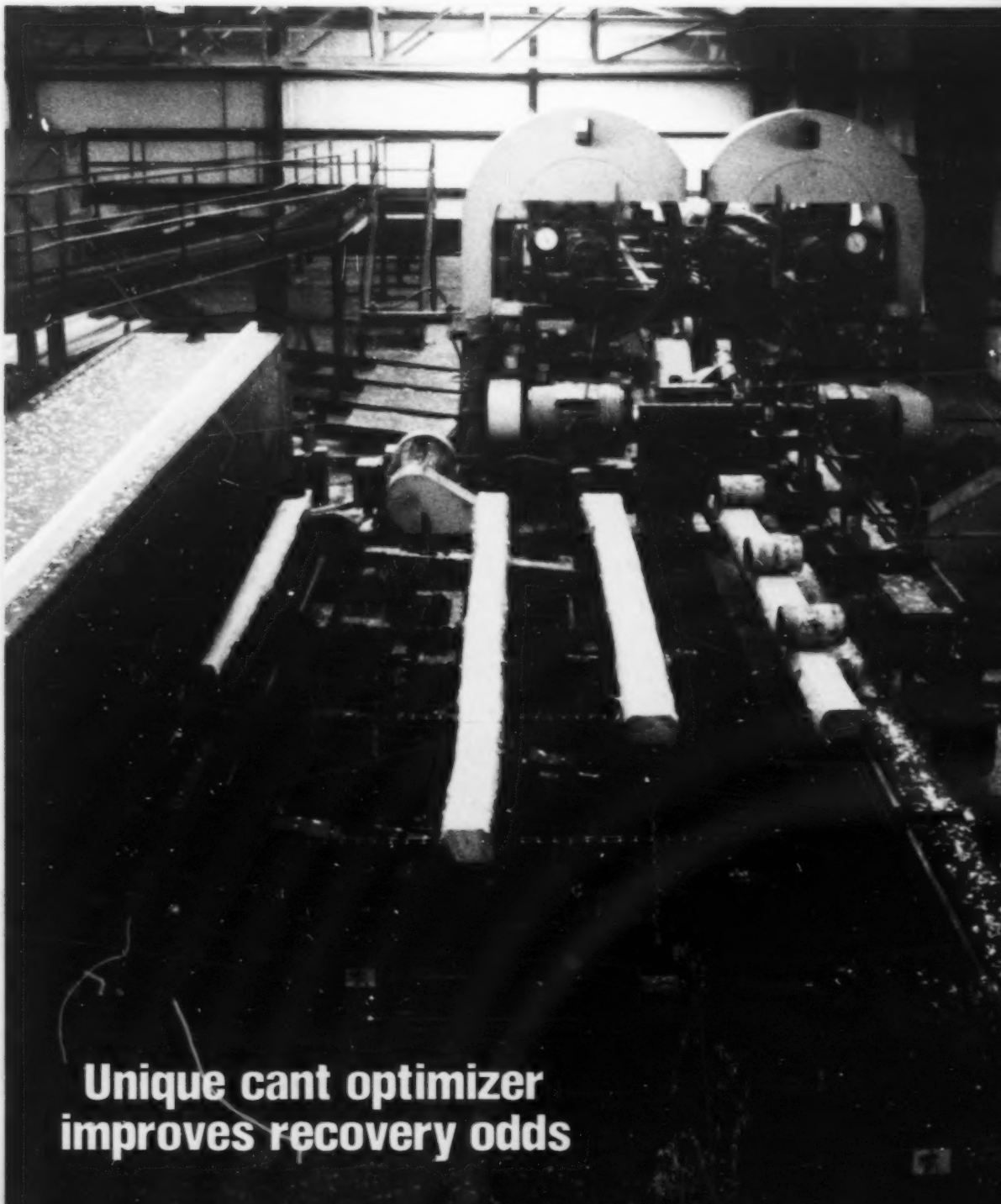

Unique cant optimizer improves recovery odds

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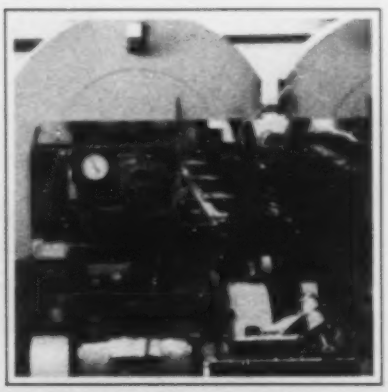

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Forest firms' profits fell with quarter's economy

SAN FRANCISCO, CALIF.—Sluggish performance in general for the U.S. economy showed up in earnings figures in the forest products industry as well.

But the news was not all bad: at least three companies, Champion International, Chesapeake and Willamette Industries, saw their first-quarter earnings jump more than 50% over the same period last year.

In general, corporate profits fell 11% during the first quarter of 1985, as compared to 1984. It was the first year-to-year drop since an 8% decline in 1983's first quarter, according to a *Wall Street Journal* survey. But economists predict a small gain for 1985 for U.S. corporate profits as a whole.

While forest products companies' profits were down 7% in the newspaper's survey (which covered 16 major integrated companies), homebuilders' combined profits were up. However, only four large homebuilding corporations were included in the *Journal* survey. Their first-quarter profits jumped 47% over 1984's first three months.

Building materials companies (not including forestry firms) reported an overall 19% rise in corporate profits. Forest products companies, on the other hand, said their earnings dropped 7% compared to 1984's first quarter.

Overcapacity and the resulting soft prices for lumber and construction panels kept profits low or nonexistent in solid wood products. But demand for coated papers and newsprint was generally good, helping boost profits on paper products in spite of weak prices for market pulp. Pulp and paper commodities, which are traded on worldwide markets, seem to be facing the same problems as lumber and plywood.

U.S. firms face additional problems because of the strong dollar. It prices exports of lumber, pulp and other products out of many markets.

Canadian companies benefited from the relative weakness of their dollar, the *Journal* reported. Its survey of Canadian companies showed an overall 13% rise in first-quarter profits. By comparison, the U.S. composite results were down 11%. Although slower economic growth in the U.S. is likely to hurt Canadian export sales, the Canadian dollar's 5% decline against the U.S. unit since Jan. 1 will partly compensate, the newspaper said.

Fourteen Canadian forestry firms reported combined first-quarter profits of nearly C$80 million, more than nine times the C$8.6 million they earned a year ago. MacMillan Bloedel's C$2.6-million profit compared to a loss of C$17.5 million in the first quarter of 1984. Crown Forest Industries also moved from a quarterly loss a year ago to profits of C$3 million this year.

What does the rest of 1985 hold, economically? As usual, economists read the statistics differently. Optimists say the economy won't do too badly until sometime next year. Pessimists warn of a recession much sooner. After 2½ years of expansion, signs of constraints on growth are growing, according to another *Wall Street Journal* survey.

Higher consumer debt levels and lower savings rates, as reported by federal agencies, indicate that the economy may not have the funds to finance growth. On the other hand, there is plenty of unused plant capacity and unemployment remains relatively high at 7.3%. These factors indicate companies could add production relatively easily.

This mixed picture could indicate that a recession is closer than the optimists believe, the *Journal* concludes. "But it's not on top of us," added Robert Gough, an economist at Data Resources Inc., an economic-analysis firm. He figures a recession could start around the end of the year, "but it's still too early to say with any degree of certainty." ■

First quarter sales and earnings

Company	1st Qtr Sales ($000)	% Chg	1st Qtr Earngs[1] ($000)	% Chg
Boise Cascade	957,520	-1.0	33,280	19.4
Champion Intl	1,645,814	7.5	43,756	80.2
Chesapeake	81,773	10.8	4,373	63.6
Crown Zellerbach	762,000	7.6	19,200	-9.4
Georgia-Pacific	1,580,000	6.2	48,000	14.6
Hammermill	428,050	1.0	7,922	-47.7
Intl Paper	1,130,000	-1.7	87,100	-32.9
Louisiana-Pacific	270,990	-12.3	-1,300	n.m.[2]
Pope & Talbot	83,053	3.3	2,200	4.3
Potlatch	234,700	-8.2	11,500	-8.0
Scott Paper	606,200	1.1	42,100	23.1
Southwest Forest	170,484	-2.5	-1,804	n.m.[2]
Temple-Inland	313,500	0.0	21,700	4.3
Union Camp	463,687	-6.5	29,766	-29.5
Weyerhaeuser	1,275,700	-0.1	38,248	4.4
Willamette	287,924	1.4	14,271	74.3
Canadian companies (figures in Canadian dollars)				
Abitibi-Price	581,433	23.5	23,723	129.3
B.C. Forest	277,600	62.1	9,000	n.m.[2]
Canfor	248,500	9.8	-18,800	n.m.[2]
Crown Forest	192,900	42.2	3,000	n.m.[2]
Domtar	527,300	3.6	28,800	26.3
Mac. Bloedel	538,600	30.8	2,600	n.m.[2]

[1] Earnings — income after taxes from continuing operations, excluding most significant nonrecurring items.

[2] Not meaningful due to loss in 1984 quarter.

Wood-fired plant set; LVL, MDF mills start

SAN FRANCISCO, CALIF.—Startups of two solid-wood plants and plans to build a wood-fired power plant top the news of capital outlays this month.

• Louisiana-Pacific Corp. has begun producing medium-density fiberboard on the first continuous MDF press in the U.S. The new Siempelkamp press is working at L-P's mill in Oroville, Calif. The MDF facility can produce 50 million ft² a year (¾-in. basis).

• Trus Joist Corp. has started up a laminated veneer lumber plant in Natchitoches, La. The $13-million plant is due for completion next year, but already employs 75; 100 people will work there when the plant is complete. It will have an annual capacity of more than 6 million bd ft of southern pine LVL.

• A Maine lumber producer and a California company will build a $30-million wood-fired electricity plant in Sherman Station, Maine. Maine Public Service Co. will buy the plant's 18 megawatts of power. Partners in the project are Sherman Lumber Co. (which will supply 30% to 40% of the plant's 260,000 tons/yr fuel needs) and Signal Energy Systems (a unit of The Signal Companies, La Jolla, Calif.). ■

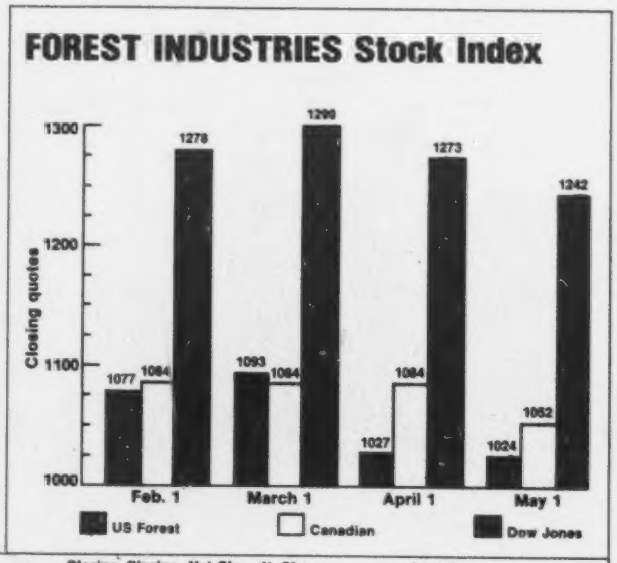
New 'FI Index' monitors industry stock performance

SAN FRANCISCO, CALIF.—In this issue of FOREST INDUSTRIES, we are proud to introduce a valuable and informative financial feature which we believe will be of great value to our readers.

Compiled by the Stock Market Analysts at Nordby International in Boulder, Colo., this financial barometer will monitor, on a monthly basis, the business climate of the publicly traded companies in the forestry industry. Such an examination can prove to be a barometer-like indication of whether future business performances will be fair or foul in this region.

This feature employs some unique concepts which will allow our readers to extract pertinent data on the financial health of the forestry industry. First of all, Nordby International Inc. has developed an index exclusively for FOREST INDUSTRIES which will give a graphic representation of the collective performance of the stocks that make up this large and diverse business region. This index is in turn compared with the Dow Jones Industrial Average Index to see exactly how they performed during the period. In other words, the individual performances of the stocks can be seen in the company-by-company table while the performance of the entire portfolio of stocks is viewed through the FOREST INDUSTRIES Stock Index.

Secondly, we will employ the Market Diary which recaps the vital statistics from the tables and graphs into a capsule format for easy review of the past month's activity. This section monitors the most active issues during the monthly period in conjunction with an index summary which compares the performance of the FI Index to a number of national index indicators. ■



Exch	Company	Ticker Symbol	Closing Price 4/1/85	Closing Price 5/1/85	Net Chg in Period	% Chg in Period	P/E Ratio	Annual Dividend Rate	Annual Dividend Yield	52 Week High	52 Week Low
OTC	Bohemia Inc.	BOHM	9.75	9.75	0.00	0.00	d	.10	1.03	13.50	7.75
NYS	Boise Cascade	BCC	38.25	38.63	.38	.99	16	1.90	4.92	44.63	32.50
NYS	Bowater Inc.	BOW	21.88	21.25	-.63	-2.88	8	.72	3.39	25.88	14.88
NYS	Champion Intl	CHA	21.13	22.00	.87	4.12	d	.40	1.82	24.75	16.88
NYS	Chesapeake	CSK	34.75	35.63	.88	2.53	10	1.24	3.48	39.50	31.25
OTC	Consol. Paper	CPER	36.75	40.25	3.50	9.52	10	.13	.32	42.50	25.13
NYS	Crown Zellerbach	ZB	41.75	41.38	-.37	-.89	16	1.00	2.42	44.88	27.75
NYS	Fed. Paper Board	FBO	18.63	17.63	-1.00	-5.37	6	.70	3.97	27.00	16.63
NYS	Ft. Howard Paper	FHP	64.00	64.75	.75	1.17	15	1.64	2.53	67.88	50.13
NYS	Georgia-Pacific	GP	21.88	20.88	-1.00	-4.57	22	.80	3.83	27.38	18.00
ASE	Glatfelter (P.H.)	GLT	30.38	34.13	3.75	12.34	15	.88	2.58	34.50	17.00
NYS	Gr. Northern Nek.	GNN	35.75	35.25	-.50	-1.40	9	1.52	4.31	43.25	31.00
NYS	Hammermill	HML	30.88	30.63	-.25	-.81	9	1.36	4.44	36.88	25.75
NYS	Intl Paper	IP	49.63	49.25	-.38	-.77	33	2.40	4.87	57.75	46.00
NYS	James River	JR	25.13	26.00	.87	3.46	8	.56	2.15	34.50	23.50
OTC	Jefferson Smurfit	JJSC	20.25	17.50	-2.75	-13.58	7	.40	2.29	25.25	15.00
NYS	Kimberly-Clark	KMB	48.63	52.50	3.87	7.96	10	2.32	4.42	53.88	39.38
NYS	Koppers Corp.	KOP	18.75	17.50	-1.25	-6.67	23	.80	4.57	23.25	17.13
OTC	Longview Fibre	LFBR	23.00	23.75	.75	3.26	11	1.28	5.39	25.75	20.25
NYS	Louisiana-Pacific	LPX	20.63	19.38	-1.25	-6.06	37	.80	4.13	25.13	17.00
NYS	Mead Corp.	MEA	38.00	37.50	-.50	-1.32	8	1.20	3.20	41.25	27.13
OTC	Mosinee Paper	MOSI	13.38	12.25	-1.13	-8.45	8	.36	2.94	14.63	11.88
NYS	Pacific Lumber	PL	25.63	24.50	-1.13	-4.41	15	1.20	4.90	29.00	21.13
OTC	Pentair Inc.	PNTA	23.25	25.00	1.75	7.53	9	.68	2.72	26.25	18.38
NYS	Pope & Talbot	POP	19.25	19.75	.50	2.60	d	.80	4.05	20.00	15.00
NYS	Potlatch Corp.	PCH	32.13	33.50	1.37	4.26	12	1.56	4.66	38.13	25.75
NYS	Scott Paper Co.	SPP	36.38	35.75	-.63	-1.73	9	1.24	3.47	39.25	25.75
OTC	Sonoco Products	SONO	46.50	46.25	-.25	-.54	d	1.44	3.11	47.25	37.50
NYS	Southwest Forest	SWF	13.75	12.00	-1.75	-12.73	26	0.00	0.00	22.13	11.75
NYS	Stone Container	STO	27.00	26.13	-.87	-3.22	9	.60	2.30	39.50	25.00
NYS	Temple-Inland	TIN	33.13	32.88	-.25	-.75	8	.64	1.95	39.50	25.50
NYS	Union Camp	UCC	34.25	34.25	0.00	0.00	10	1.64	4.79	41.25	30.88
NYS	Westvaco Corp.	W	37.50	37.75	.25	.67	8	1.32	3.50	41.00	31.75
NYS	Weyerhaeuser Co.	WY	28.38	27.13	-1.25	-4.40	18	1.30	4.79	34.00	25.00
OTC	Willamette Ind.	WMTT	37.00	38.75	1.75	4.73	8	1.50	3.87	46.25	23.25
Canadian Forest Products Companies											
TOR	Abitibi-Price	—	55.50	53.38	-2.12	-3.82	16	1.60	3.00	57.75	24.50
TOR	BC Forest Prod.	—	9.75	9.25	-.50	-5.13	57	.13	1.41	12.50	8.38
TOR	Canfor Ltd.	—	9.25	9.50	.25	2.70	d	0.00	0.00	23.75	9.00
TOR	Consol.-Bathurst	—	17.50	16.38	-1.12	-6.40	13	.60	3.66	18.50	12.63
TOR	Crestbrook	—	8.00	8.00	0.00	0.00	66	.05	.62	10.00	7.50
TOR	Crown For. Ind.	—	30.50	30.63	.13	.43	d	0.00	0.00	31.50	30.25
TOR	Domtar Inc.	—	38.38	35.88	-2.50	-6.51	8	1.40	3.90	39.63	29.00
MON	Donohue Inc.	—	17.38	16.75	-.63	-3.62	8	.72	4.30	19.75	12.50
TOR	Great Lakes	—	89.00	87.00	-2.00	-2.25	25	1.60	1.84	96.00	76.00
TOR	MacMil. Bloedel	—	26.00	25.38	-.62	-2.38	—	2.12	8.35	33.25	22.75

Market Diary

Most Active Issues

Largest dollar gainer: Kimberly-Clark, +$3.87
Largest dollar loser: Jefferson Smurfit, -$2.75
Largest percentage gainer: Glatfelter (P.H.), +12.34%
Largest percentage loser: Jefferson Smurfit, -13.58%

Advances, 14; Declines, 19; Unchanged, 2; New highs, 0; New lows, 0

KEY: (H) = New High; (L) = New Low; (d) = Deficit. NYS = New York; ASE = American; OTC = Over the Counter; MON = Montreal; TOR = Toronto..

All OTC quotes are represented as the bid price. All Canadian quotes are in Canadian dollars.

Compiled by Nordby International Inc., Boulder, Colo. (303) 449-6526.

The information and statistics contained herein have been obtained from sources believed to be reliable, but are not guaranteed to be all-inclusive or complete. This is not to be construed as an offer or the solicitation of an offer to sell the securities herein mentioned. This information is subject to change without notice.

Market Diary	Close 4/1/85	Close 5/1/85	Net Chg in Pd	% Chg in Pd
FI Stock Index	1027.24	1024.41	-2.83	-.28
Canadian Forestry Stock Index	1084.16	1052.36	-31.80	-2.93
Dow Jones Industrial Ave.	1272.75	1242.05	-30.70	-2.41
Standard & Poor's 500-Stock Index	181.27	178.37	-2.90	-1.60
Standard & Poor's 400 Industrials	202.25	198.32	-3.93	-1.94
NYSE Composite	104.90	103.35	-1.55	-1.48

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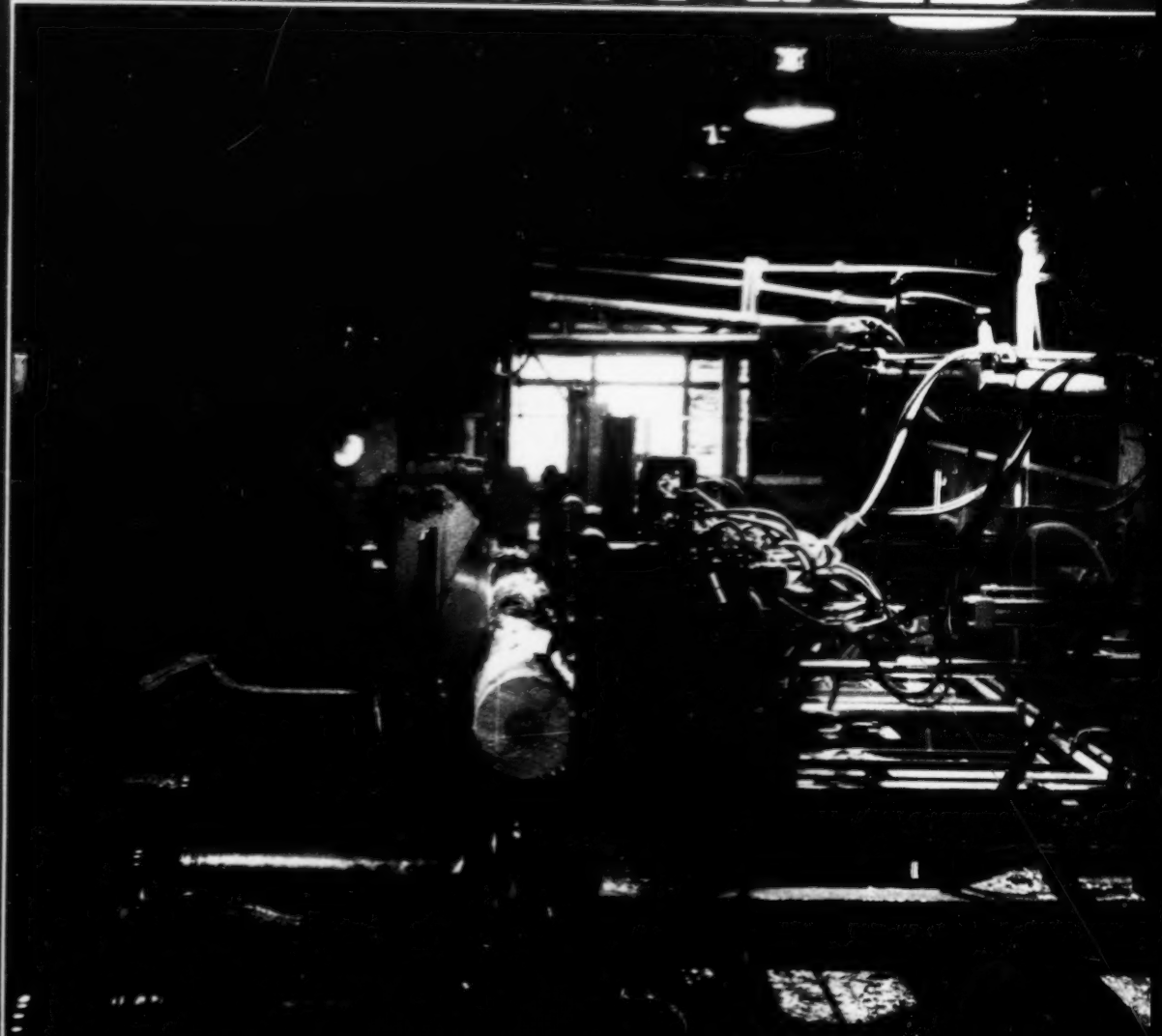
JULY 1985

FOREST INDUSTRIES

LOGGING/PULPWOOD/FORESTRY/LUMBER/PANELS



1985 ANNUAL Lumber Review

Bypass feeds pony rig, eliminates bottleneck

1985 Volume 112 Number 7

JULY

24 **1985 ANNUAL Lumber Review**

Despite healthy economy, lumber's woes persist

Last year's prediction for 1984 proved correct: it wasn't a great year for the lumber industry. Our Annual Lumber Review includes a listing of North America's leading lumber producers

36

Loggers keep costs low by relying on old equipment and careful maintenance

The partners in Total Tree Logging, Newport, Ore., started on a shoestring and had to 'make do' without buying any fancy machinery. They prove that doesn't prevent a quality harvest

33

Cogeneration gives mill 'third leg' to help run on

Dinuba Timber Industries mills at Dinuba and Auberry, Calif., find that supplying a new product—electricity—can help keep the sawmills profitable

38

Brothers add a personal touch in building their own hardwood sawmill

Wayne and Clyde Cruse built their own mill to process oversized hardwoods. It took a long time, but it is generating good volume and grade recovery

40

Buyers bring bankrupt sawmills in the Pacific Northwest back to life

A little-known Oregon company, WTD Industries, has purchased several bankrupt mills in the past few years and restarted them. Incentives for employees are stressed at revived mills

Cover story, page 33

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For the Record

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FI Stock Index

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Meetings

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Computing for Profit

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Equipment

FI STOCK INDEX

Exch	Company	Ticker Symbol	Closing Price 5/1/85	Closing Price 6/3/85	Net Chg in Period	% Chg in Period	P/E Ratio	Annual Div Rate	Annual Div Yield	52 Week High	52 Week Low
OTC	Bohemia Inc.	BOHM	9.75	11.25	1.50	15.38	d	.10	.89	13.50	7.75
NYS	Boise Cascade (H)	BCC	38.63	44.75	6.12	15.84	19	1.90	4.25	44.88	32.50
NYS	Bowater Inc.	BOW	21.25	21.88	.63	2.96	8	.72	3.29	25.88	14.88
NYS	Champion Intl	CHA	22.00	23.38	1.38	6.27	d	.40	1.71	24.75	16.88
NYS	Chesapeake	CSK	35.63	34.13	-1.50	-4.21	9	1.24	3.63	39.50	31.25
OTC	Consol. Paper	CPER	40.25	45.75	5.50	13.66	11	1.48	3.23	46.25	25.13
NYS	Crown Zellerbach	ZB	41.38	40.63	-.75	-1.81	16	1.00	2.46	44.88	27.75
NYS	Fed. Paper Board	FBO	17.63	18.88	1.25	7.09	7	.70	3.71	27.00	16.63
NYS	Ft. Howard Paper (H)	FHP	64.75	74.38	9.63	14.87	17	1.64	2.20	74.38	52.63
NYS	Georgia-Pacific	GP	20.88	23.00	2.12	10.15	24	.80	3.48	27.38	18.00
ASE	Glatfelter (P.H.)	GLT	34.13	32.25	-1.88	-5.51	7	.88	2.73	34.50	18.25
NYS	Gr. Northern Nek.	GNN	35.25	35.88	.63	1.79	9	1.52	4.24	40.25	31.00
NYS	Hammermill	HML	30.63	34.88	4.25	13.88	11	1.36	3.90	35.88	25.75
NYS	Intl Paper	IP	49.25	50.63	1.38	2.80	34	2.40	4.74	57.75	46.00
NYS	James River	JR	26.00	30.25	4.25	16.35	10	.56	1.85	34.50	23.50
OTC	Jefferson Smurfit	JJSC	17.50	19.25	1.75	10.00	8	.40	2.08	25.25	15.00
NYS	Kimberly-Clark (H)	KMB	52.50	57.88	5.38	10.25	11	2.32	4.01	58.50	39.38
NYS	Koppers Corp.	KOP	17.50	17.75	.25	1.43	24	.80	4.51	22.63	17.00
OTC	Longview Fibre	LFBR	23.75	25.00	1.25	5.26	13	1.28	5.12	25.75	20.75
NYS	Louisiana-Pacific	LPX	19.38	22.25	2.87	14.81	42	.80	3.60	25.13	17.00
NYS	Mead Corp.	MEA	37.50	40.88	3.38	9.01	9	1.20	2.94	43.38	28.88
OTC	Mosinee Paper	MOSI	12.25	13.13	.88	7.18	9	.36	2.74	14.63	11.75
NYS	Pacific Lumber	PL	24.50	25.38	.88	3.59	15	1.20	4.73	29.00	21.13
OTC	Pentair Inc.	PNTA	25.00	24.50	-.50	-2.00	9	.68	2.78	26.25	18.38
NYS	Pope & Talbot (H)	POP	19.75	20.75	1.00	5.06	d	.80	3.86	21.50	15.00
NYS	Potlatch Corp.	PCH	33.50	35.38	1.88	5.61	13	1.56	4.41	38.13	25.75
NYS	Scott Paper Co.	SPP	35.75	38.88	3.13	8.76	10	1.24	3.19	39.25	25.88
OTC	Sonoco Products	SONO	46.25	47.00	.75	1.62	d	1.44	3.06	47.38	37.50
NYS	Southwest Forest	SWF	12.00	12.13	.13	1.08	26	0.00	0.00	20.13	11.75
NYS	Stone Container	STO	26.13	27.38	1.25	4.78	10	.60	2.19	39.00	25.00
NYS	Temple-Inland	TIN	32.88	34.50	1.62	4.93	8	.64	1.86	39.50	25.50
NYS	Union Camp	UCC	34.25	36.25	2.00	5.84	10	1.64	4.52	41.25	31.63
NYS	Westvaco Corp.	W	37.75	38.88	1.13	2.99	9	1.32	3.40	41.75	33.00
NYS	Weyerhaeuser Co.	WY	27.13	28.88	1.75	6.45	19	1.30	4.50	34.00	25.75
OTC	Willamette Ind.	WMTT	38.75	37.75	-1.00	-2.58	8	1.65	4.37	46.25	23.25
Canadian Forest Products Companies											
TOR	Abitibi-Price (H) **	—	17.88	19.25	1.37	7.66	16	—	—	19.25	8.13
TOR	BC Forest Prod.	—	9.25	9.38	.13	1.41	59	.13	1.39	12.50	8.38
TOR	Canfor Ltd.	—	9.50	9.63	.13	1.37	d	0.00	0.00	18.75	8.25
TOR	Consol.-Bathurst	—	16.38	16.25	-.13	-.79	13	.60	3.69	18.50	12.63
TOR	Crestbrook	—	8.00	8.00	0.00	0.00	68	.05	.62	9.75	7.00
TOR	Crown For. Ind.	—	30.63	30.63	0.00	0.00	d	0.00	0.00	31.50	30.25
TOR	Domtar Inc.	—	35.88	36.25	.37	1.03	8	1.40	3.86	39.63	29.00
MON	Donohue Inc.	—	16.75	18.50	1.75	10.45	9	.72	3.89	19.50	14.50
TOR	Great Lakes !!	—	21.75	21.25	-.50	-2.30	25	.40	1.88	24.00	19.00
TOR	MacMillan Bloedel	—	25.38	21.75	-3.63	-14.30	—	—	—	29.75	20.50

Market Diary

Most Active Issues

Largest dollar gainer ..... Fort Howard Paper ..... +$9.63
Largest dollar loser ..... Glatfelter (P.H.) ..... -$1.88
Largest percentage gainer ..... James River ..... + 16.35%
Largest percentage loser ..... Glatfelter (P.H.) ..... -5.51%

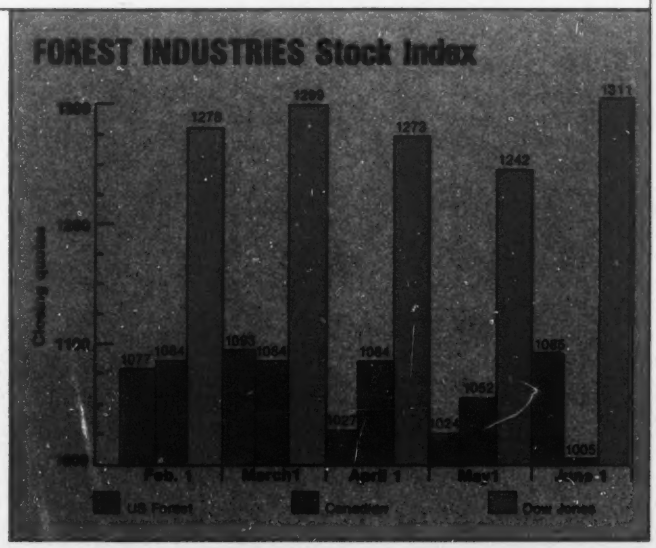
Advances, 35; Declines, 8; Unchanged, 2; New highs, 5; New lows, 0

Key

(H) New High; (L) = New Low; (D) = Deficit.
MON Montreal; NYS = New York; ASE = American; OTC Over the Counter; TOR = Toronto.
** Reflects 3-for-1 stock split
!! Reflects 4-for-1 stock split

All OTC quotes are represented as the bid price.
All Canadian quotes are in Canadian dollars.

	Close 5/1/85	Close 6/3/85	Net Chg in Pd	% Chg in Pd
Forest Industries Stock Index	1024.41	1084.91	60.50	5.91
Canadian Forestry Stock Index	1052.36	1004.66	-47.70	-4.53
Dow Jones Industrial Ave.	1242.05	1310.93	68.88	5.55
Standard & Poor's 500-Stock Index	178.37	189.32	10.95	6.14
Standard & Poor's 400 Industrials	198.32	209.30	10.98	5.54
NYSE Composite	103.35	109.61	6.26	6.06



Compiled by Nordby International Inc., Boulder, Colo. (303) 449-0326.

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Last year's prediction for 1984 proved correct: it wasn't a great year for the lumber industry. The outlook isn't too promising for '85, either

Overall economy looks okay, but lumber's woes persist

San Francisco, California

Dragged down by overcapacity and imports, last year was mediocre at best for U.S. lumber producers. Uninspiring results occurred despite a strong housing market, which has continued this year as interest rates fell.

So, unfortunately for the lumber industry, have those uninspiring results. And conditions aren't all that much brighter in Canada, despite loud complaints about Canadian competition from many lumber producers in the U.S.

A year of shakeout

As the National Forest Products Assn. explained it, "1984 was a year of shakeout in an industry tremendously changed by the longest postwar recession. The industry has not shared in the economic recovery. Lumber prices have been at historic lows, despite two very good housing years and the prospect for a third. The real price of lumber has declined in the past five years."

Although most U.S. lumbermen vigorously campaigned for Ronald Reagan's election in 1980 and reelection last year, their industry hasn't enjoyed the renewed prosperity evident in other sectors. Much of the lumber industry may be based in the Sunbelt, but its condition is more akin to that of industries in the Rust Bowl.

In 1984, inflation-adjusted growth in the Gross National Product came close to 7%, the best annual gain in almost 30 years. This year, interest rates have started a decline so steady that it's now possible to find mortgages under 10% annual interest. They're adjustable, to be sure, but a far cry from the 18% mortgages that nearly killed housing markets a few years ago.

Home construction reached 1.7 million units last year, and is likely to stay in that neighborhood this year, thanks to those lower interest rates. Building rates this high mean higher lumber and panel consumption.

Production figures revised

Both lumber production and shipments climbed in 1984. If you use the figures reported in last year's lumber review, you would find an incredible 16.5% gain from 31.479 billion bd ft to 36.677 billion. And that's just what the figure is: incredible. U.S. lumber production statistics for 1976-84 have been revised to change under-reporting by the Commerce Department. Commerce statisticians had based their national sample on old mill lists.

Using the revised figures boosts the 1984 lumber output total to 35.298 billion bd ft—12.1% higher than the old figure. This changes the 1985 production increase to a believable 3.9%.

Higher productivity at mills

While some mills have closed—usually older, inefficient producers—plenty of companies have installed modern machines and controls to get more lumber from every log. Regular FOREST INDUSTRIES readers will remember numerous articles detailing productivity and efficiency gains in sawmills which resulted from modernization.

These mills cut more lumber at lower cost. According to the federal Bureau of Labor Statistics, the sawmill industry's productivity has grown at an average 4.1% a year between 1978 and 1983. This is more than double the rate from 1958-78. These increases keep capacity high—enough to supply hundreds of thousands of additional housing starts. So prices stay down despite higher demand than in the recession-wracked 1981-82 period.

Depressed lumber prices

Random Lengths, the price-reporting newsletter published in Eugene, Ore., has created a composite lumber price index. Adjusting this index to

TABLE 1—United States Lumber Production

	Softwood Lumber Production, By Regions						
Year	Southern Pine	Douglas Fir	Western Pine	California Redwood	Other	Total Softwood Production	Total Softwood Consumption
1975	6.967	7.134	8.445	1.690	1.475	25.711	30.309
1976	7.893	8.322	9.789	2.001	1.688	29.693	36.086
1977	8.879	8.796	10.309	2.000	1.753	31.737	40.909
1978	9.231	8.845	10.033	1.902	2.046	32.057	42.640
1979	9.283	8.427	9.780	1.818	2.124	31.432	40.608
1980	8.217	6.815	7.613	1.589	2.012	26.246	33.832
1981	8.415	6.270	7.147	1.452	1.392	24.676	32.064
1982	8.754	5.743	6.681	1.300	1.309	23.787	31.173
1983	10.406	7.934	8.488	1.580	1.436	29.844	39.742
1984	10.844	8.113	8.923	1.750	1.497	31.127	42.936

Figures in recent years subject to revision.

eliminate inflation shows that lumber prices today are only slightly higher than in the depth of the recession, and are far below what they were in the housing-boom years of 1977-79.

In 1967 dollars, the lumber composite peaked at over $120 per 1000 bd ft during that boom period, and frequently averaged around $110. The index then fell sharply through the recession to a little over $50 (in 1967 dollars) in the 1982-83 winter. Spring building booms brought peaks in the mid-$80s in 1983 and the low $70s in 1984.

This May, prices again headed up—but were only in the mid-$60s in those uninflated dollars. (In current dollars, the *Random Lengths* lumber composite stood at $238 as of May 31.)

This steady fall in real lumber prices doubtless was pushed along by increased lumber imports from Canada. Canadians also boosted productivity, and the Canadian dollar has fallen steadily in value against the U.S. dollar. It currently averages a little less than 73¢.

However, Canadian lumber production rose a bit less than U.S. output last year: 3.7% to 21.134 billion bd ft. British Columbia continued its dominance, cutting nearly 62% of Canada's total. This is down from 64% in 1983, as B.C.'s output grew only 0.3% during the year to nearly 13.1 billion bd ft.

B.C.'s lumber production is nearly equal to the 13.2 billion bd ft of lumber Canada sold to the United States last year. Canadian exports to the U.S. accounted for 62% of production; five years ago, Canada sold 51% of its lumber south of the border.

Another way of looking at the issue: Canadians cut 30.8% of all the softwood lumber consumed in the U.S. in 1984, up from 18.7% in 1975. It's a big business: federal agencies estimate the value of Canadian softwood lumber sold in the U.S. last year at nearly $2.54 billion. All Canadian solid-wood sales to the U.S. amounted to almost $3.44 billion, or a little more than 5% of Canada's $67 billion of exports to the U.S.

TABLE 2—Canadian Lumber Production Softwood and Hardwood, 1975-1984 (billion bd ft)

Year	B.C. Coast	B.C. Interior	Total B.C.	East of Rockies	Total Canada
1975	2.504	4.965	7.469	3.851	11.320
1976	3.988	6.757	10.745	4.779	15.524
1977	4.499	7.539	12.038	5.629	17.667
1978	4.803	7.742	12.545	6.432	18.977
1979	4.657	7.861	12.518	6.480	18.998
1980	4.252	7.727	11.980	6.923	18.903
1981	3.458	6.966	10.424	6.473	16.897
1982	3.170	6.939	10.109	5.887	15.996
1983	4.140	8.903	13.043	7.328	20.371
1984	3.903	9.175	13.078	8.056	21.134

Source: Statistics Canada

Slow growth forecast

According to Citicorp Information Services, the U.S. economy won't do as well in the next couple of years as it has in the past two. This year's growth in the GNP started slow. A major reason for this was imports, Citicorp said. Consumer demand was relatively strong, but imported goods satisfied much of this demand. While GNP rose at 1.3% in 1985's first quarter, domestic purchases went up 5%. Imports accounted for the difference.

Lumber production started in 1985 around 7% below 1984's level, Citicorp estimated, while output of panels and other wood products rose 4%. These forecasters expect lumber production to be about the same this year as in 1984.

Looking to 1986-87, Citicorp predicts housing starts will fall 20% as interest rates rise and the U.S. economy moves into recession. Recovery will return in 1988-90; Citicorp predicts U.S. domestic demand for wood products in 1990 will be about the same as it is now.

There's one glimmer for U.S. producers, however: the firm forecasts "a reduction of the U.S. trade deficit in wood products." That would result in 3% to 4% higher production by 1990.

FI's annual survey

Again this year the FOREST INDUSTRIES editorial staff attempted to gather production figures from the top lumber producers in the U.S. and Canada. We mailed questionnaires to over 500 companies, and then contacted all non-respondents by telephone. At press time, we had gathered production figures from nearly 470 companies. The leading producers in our survey are listed on the following pages, ranked in order of 1984 production.

We have tried to include all the leading producers in North America, but some companies may have been overlooked. We invite readers to notify us of any omissions in this year's survey. ■

and Consumption, 1975-1984 (billion bd ft)

Hardwood Lumber Production, By Regions			Total Hardwood Production	Total Hardwood Consumption	Total Lumber Production	Total Lumber Consumption
Southern	Appalachian	Other				
2.761	1.109	2.002	5.872	5.791	31.583	36.100
3.033	1.171	2.213	6.417	6.441	36.110	42.527
3.063	1.207	2.410	6.680	6.890	38.417	47.699
3.242	1.228	2.527	6.997	6.997	39.054	49.637
3.452	1.261	2.581	7.294	6.939	38.726	47.547
3.314	1.211	2.533	7.058	6.272	33.304	40.104
3.343	1.225	1.626	6.194	5.855	30.870	37.919
2.061	0.602	2.399	5.062	5.098	28.849	36.270
2.195	0.648	2.611	5.454	5.397	35.298	45.138
2.503	0.475	2.737	5.715	5.294	36.842	46.229

Source: National Forest Products Assn.

Comparative data — Top 100 companies — 1975-1984

(Millions of bd ft, hardwood and softwood; includes U.S. and Canada)

Year	Total volume reported by Top 100 Co.'s	Number mills in Top 100	Total volume by year's top producer	Cutoff volume of year's 100th producer	Co.'s producing more than 1 billion bd ft
1975	22,023	633	2,530	56.500	2
1976	27,978	639	2,702	77.333	4
1977	30,988	645	2,806	85.282	5
1978	32,142	629	2,662	90.634	5
1979	31,599	634	2,955	91.300	4
1980	28,037	641	2,889	80.000	4
1981	26,956	657	2,744	74.580	3
1982	26,043	603	2,147	71.000	4
1983	34,305	610	3,123	98.058	5
1984	35,870	585	2,989	100.708	5

Leading lumber producers, U.S. and Canada

(All lumber production figures given in board feet)
(Companies ranked according to data received by FOREST INDUSTRIES)

Company name & number of mills	Headquarters	'84 Hardwood	'84 Softwood	'84 Total	'83 Total
1. Weyerhaeuser Co. (32 mills)	Tacoma, Wash.	0	2,989,000,000	2,989,000,000	3,123,000,000
2. Louisiana-Pacific Corp. (67)	Portland, Ore.	29,000,000	1,983,000,000	2,012,000,000	1,676,000,000
3. Champion International Corp. (29)	Stamford, Conn.	27,739,000	1,719,290,000	1,747,029,000	1,852,084,000
4. Georgia-Pacific Corp. (37)	Atlanta, Ga.	193,000,000	1,457,000,000	1,650,000,000	1,603,000,000
5. Canfor Corp. (14)	Vancouver, B.C.	0	1,223,300,000	1,223,300,000	1,184,600,000
6. British Columbia Forest Products Ltd. (10)	Vancouver, B.C.	0	970,000,000	970,000,000	899,000,000
7. West Fraser Mills Ltd. (6)	Quesnel, B.C.	0	965,594,000	965,594,000	846,585,000
8. Weldwood of Canada Ltd. (10)	Vancouver, B.C.	24,000,000	825,131,000	849,131,000	668,000,000
9. MacMillan Bloedel Ltd. (10)	Vancouver, B.C.	0	845,000,000	845,000,000	822,000,000
10. Boise Cascade Corp. (17)	Boise, Idaho	0	825,000,000	825,000,000	833,000,000
11. International Paper Co. (11)	Dallas, Texas	0	770,747,000	770,747,000	760,350,000
12. Northwood Pulp and Timber Ltd. (4)	Prince George, B.C.	0	695,419,000	695,419,000	617,596,000
13. Westar Timber Ltd. (5)	Vancouver, B.C.	0	590,000,000	590,000,000	447,753,000
14. Pope and Talbot Inc. (5)	Portland, Ore.	0	570,612,000	570,612,000	517,087,000
15. Sierra Pacific Industries (8)	Redding, Calif.	0	568,322,000	568,322,000	556,445,000
16. Whonnock Industries Ltd. (7)	Vancouver, B.C.	0	531,000,000	531,000,000	632,000,000
17. Eurocan Pulp and Paper Co. Ltd. (3)	Kitimat, B.C.	0	509,000,000	509,000,000	299,000,000
18. Balfour Forest Products Inc. (5)	Prince George, B.C.	0	496,000,000	496,000,000	496,000,000
19. Simpson Timber Co. (6)	Seattle, Wash.	0	491,000,000	491,000,000	517,000,000
20. Potlatch Corp. (8)	Lewiston, Idaho	14,276,000	429,685,000	443,961,000	464,528,000
21. Roseburg Forest Products (4)	Roseburg, Ore.	0	443,000,000	443,000,000	486,000,000
22. Publishers Paper Co. (4)	Lake Oswego, Ore.	0	436,000,000	436,000,000	434,588,000
23. Doman Industries Ltd. (5)	Duncan, B.C.	0	430,000,000	430,000,000	397,000,000
24. Crown Forest Industries Ltd. (5)	Vancouver, B.C.	0	411,549,000	411,549,000	456,994,000
25. Union Camp Corp. (9)	Savannah, Ga.	27,713,000	378,017,000	405,730,000	376,438,000
26. Plum Creek Timber Co. Inc. (7)	Columbia Falls, Mont.	0	379,906,000	379,906,000	415,922,000
27. DAW Forest Products (5)	Spokane, Wash.	0	376,000,000	376,000,000	—
28. Continental Group Inc. (9)	Savannah, Ga.	0	360,000,000	360,000,000	352,000,000
29. Normick Perron Inc. (6)	La Sarre, Que.	0	342,000,000	342,000,000	356,500,000
30. Willamette Industries Inc. (9)	Portland, Ore.	0	319,000,000	319,000,000	278,000,000
31. Donohue Inc. (4)	Quebec, Que.	0	318,713,000	318,713,000	278,997,000
32. Crestbrook Forest Industries Ltd. (3)	Cranbrook, B.C.	0	318,000,000	318,000,000	273,000,000
33. Southwest Forest Industries (10)	Phoenix, Ariz.	25,327,000	288,567,000	313,894,000	276,012,000
34. Bohemia Inc. (7)	Eugene, Ore.	0	280,500,000	280,500,000	267,000,000
35. J. D. Irving Ltd. (7)	Saint John, N.B.	0	275,000,000	275,000,000	250,000,000
36. Hammermill Paper Co. (11)	Erie, Pa.	88,296,000	178,167,000	266,463,000	267,655,000
37. RSG Forest Products Inc. (3)	Kalama, Wash.	0	253,600,000	253,600,000	240,511,382
38. W-I Forest Products Inc. (7)	Lake Oswego, Ore.	0	252,905,000	252,905,000	270,281,000
39. Crown Zellerbach Corp. (5)	San Francisco, Calif.	0	249,400,000	249,400,000	233,500,000
40. Gilman Paper Co. (4)	Saint Marys, Ga.	0	245,000,000	245,000,000	210,000,000
41. Georgia Kraft Co., Woodkraft Div. (4)	Peachtree City, Ga.	0	240,000,000	240,000,000	190,000,000
42. Great Northern Nekoosa Corp. (4)	Stamford, Conn.	0	239,400,000	239,400,000	167,700,000
43. Coastal Lumber Co. (17)	Weldon, N.C.	120,915,000	115,890,000	236,805,000	227,500,000

Company name & number of mills	Headquarters	'84 Hardwood	'84 Softwood	'84 Total	'83 Total
44. Pacific Lumber and Shipping Co. (3)	Seattle, Wash.	0	235,000,000	235,000,000	187,273,922
45. Stimson Lumber Co. (3)	Portland, Ore.	0	232,410,000	232,410,000	220,000,000
46. Saucier Forest Products Ltd. (2)	Comtois, Que.	0	230,000,000	230,000,000	163,180,000
47. E. B. Eddy Forest Products Ltd. (4)	Ottawa, Ont.	0	219,427,000	219,427,000	165,160,000
48. Evans Products Co. Ltd. (3)	Kamloops, B.C.	0	206,665,000	206,665,000	221,332,000
49. Slocan Forest Products Ltd. (2)	Richmond, B.C.	0	204,940,000	204,940,000	205,079,000
50. Idaho Forest Industries (4)	Coeur 'D Alene, Idaho	0	197,844,000	197,844,000	173,568,000
51. Rustad Bros. and Co. Ltd. (1)	Prince George, B.C.	0	193,700,000	193,700,000	166,800,000
52. Pacific Forest Products (2)	Vancouver, B.C.	0	193,000,000	193,000,000	227,000,000
53. Forex Inc. (7)	Val D'Or, Que.	0	190,000,000	190,000,000	160,000,000
54. Finlay Forest Industries Ltd. (2)	Mackenzie, B.C.	0	188,000,000	188,000,000	186,000,000
55. WTD Industries (4)	Portland, Ore.	0	185,594,000	185,594,000	137,054,000
56. Mountain Fir Lumber Co. Inc. (4)	Salem, Ore.	0	185,285,000	185,285,000	187,807,000
57. Eel River Sawmills Inc. (3)	Fortuna, Calif.	0	185,202,000	185,202,000	181,947,000
58. Federal Paper Board Co. Inc. (2)	Riegelwood, N.C.	0	185,000,000	185,000,000	165,000,000
59. Abitibi-Price Inc. (4)	Toronto, Ont.	0	181,148,000	181,148,000	180,642,000
60. Tahsis Co. Ltd. (2)	Vancouver, B.C.	0	180,000,000	180,000,000	168,000,000
61. Brunswick Pulp and Paper Co. (3)	Brunswick, Ga.	0	178,000,000	178,000,000	—
62. Ainsworth Lumber Co. Ltd. (2)	Hundred Mile House, B.C.	0	170,000,000	170,000,000	150,000,000
63. Tolko Industries Ltd. (2)	Vernon, B.C.	0	170,000,000	170,000,000	160,000,000
64. Materiaux Blanchet Inc. (3)	St. Pamphile, Que.	0	165,000,000	165,000,000	115,000,000
65. Willamina Lumber Co. (3)	Portland, Ore.	6,954,000	157,269,000	164,223,000	118,818,000
66. Great Lakes Forest Products Ltd. (2)	Thunder Bay, Ont.	0	162,000,000	162,000,000	137,000,000
67. Manville Forest Products Corp. (2)	West Monroe, La.	0	160,000,000	160,000,000	150,000,000
68. Vaagen Bros. Lumber (3)	Colville, Wash.	0	160,000,000	160,000,000	117,000,000
69. American Forest Products Co. (3)	San Francisco, Calif.	0	156,551,000	156,551,000	131,345,000
70. Pinette and Therrien Mills Ltd. (2)	Williams Lake, B.C.	0	156,000,000	156,000,000	143,000,000
71. Jacobson Bros. Forest Products Ltd. (1)	Williams Lake, B.C.	0	152,223,194	152,223,194	139,564,747
72. Carrier Lumber Ltd. (1)	Prince George, B.C.	0	150,188,892	150,188,892	133,609,743
73. Lignum Ltd. (1)	Vancouver, B.C.	0	150,000,000	150,000,000	135,125,000
74. Seneca Sawmill Co. (2)	Eugene, Ore.	0	142,494,000	142,494,000	118,239,000
75. Sequoia Forest Industries (3)	Dinuba, Calif.	0	138,000,000	138,000,000	123,000,000
76. The Pas Lumber Co. Ltd. (1)	Prince George, B.C.	0	137,455,000	137,455,000	185,657,000
77. Summit Timber Co. (1)	Darrington, Wash.	0	135,346,000	135,346,000	114,601,000
78. G. W. Martin Lumber Ltd. (5)	Harcourt, Ont.	86,000,000	46,000,000	132,000,000	60,000,000
79. The Pacific Lumber Co. (3)	San Francisco, Calif.	0	131,253,000	131,253,000	127,796,000
80. Revelstoke Companies Ltd. (4)	Calgary, Alta.	0	129,000,000	129,000,000	118,000,000
81. Curt Bean Lumber Co. Inc. (2)	Amity, Ark.	0	128,600,000	128,600,000	52,000,000
82. Diamond Lands Corp. (1)	Red Bluff, Calif.	0	128,000,000	128,000,000	130,000,000
83. Domtar Forest Products (2)	Montreal, Que.	0	126,000,000	126,000,000	143,129,000
84. S&R Sawmills Ltd. (3)	Surrey, B.C.	0	124,000,000	124,000,000	119,000,000
85. Owens-Illinois Inc. (3)	Toledo, Ohio	6,800,000	116,928,000	123,728,000	119,880,000
86. Northside Lumber Co. (2)	Philomath, Ore.	0	123,600,000	123,600,000	98,500,000
87. Clearwater Timber Products Ltd. (3)	Kamloops, B.C.	0	120,000,000	120,000,000	130,000,000
88. Kirby Forest Industries Inc. (2)	Houston, Texas	0	119,689,000	119,689,000	135,755,000
89. Anthony Timberlands Inc. (3)	Bearden, Ark.	31,124,000	85,911,000	117,035,000	103,240,000
90. Lakeland Mills Ltd. (1)	Prince George, B.C.	0	116,018,000	116,018,000	109,596,000
91. Joe N. Miles and Sons Inc. (3)	Lumberton, Miss.	0	113,000,000	113,000,000	110,000,000
92. F. H. Stoltze Land and Lumber Co. (3)	Columbia Falls, Mont.	0	109,818,696	109,818,696	87,695,177
93. Medford Corp. (2)	Medford, Ore.	0	109,466,000	109,466,000	105,199,000
94. Kaibab Industries (3)	Phoenix, Ariz.	0	108,946,000	108,946,000	90,859,000
95. Hanel Lumber Co. Inc. (1)	Hood River, Ore.	0	108,188,000	108,188,000	92,174,000
96. Rosboro Lumber Co. (2)	Springfield, Ore.	0	107,707,000	107,707,000	115,013,000
97. Harwood Products (2)	Willits, Calif.	0	107,000,000	107,000,000	98,000,000
98. Fort Apache Timber Co. (1)	Whiteriver, Ariz.	0	105,852,000	105,852,000	110,151,000
99. Brazier Forest Products Inc. (3)	Tacoma, Wash.	0	105,000,000	105,000,000	89,778,000
100. American Timber Co. (1)	Olney, Mont.	0	100,708,287	100,708,287	93,387,441
101. TMA Forest Products Group (3)	Ackerman, Miss.	0	98,729,000	98,729,000	93,299,000
102. Scierie des Outardes (1)	Baie Comeau, Que.	98,200,000	0	98,200,000	56,700,000
103. Northwest Hardwoods (2)	Portland, Ore.	94,900,000	0	94,900,000	77,800,000
104. Deltic Farm and Timber Co. Inc. (2)	El Dorado, Ark.	0	94,035,328	94,035,328	64,877,266
105. Bennett Lumber Products Inc. (2)	Princeton, Idaho	0	93,934,000	93,934,000	88,533,106
106. ITT Rayonier Inc. (4)	Stamford, Conn.	93,400,000	0	93,400,000	102,626,000
107. Duke City Lumber Co. Inc. (5)	Albuquerque, N.M.	0	93,391,258	93,391,258	86,000,000
108. Fort Hill Lumber Co. (1)	Portland, Ore.	0	93,000,000	93,000,000	57,022,907
109. Leaf River Forest Products (1)	New Augusta, Miss.	0	93,000,000	93,000,000	70,000,000
110. Consolidated-Bathurst Inc. (4)	Montreal, Que.	0	91,512,000	91,512,000	99,560,000
111. Eugene F. Burrill Lumber Co. (1)	White City, Ore.	0	89,078,000	89,078,000	84,276,000
112. Miller Western Industries (1)	Edmonton, Alta.	0	89,000,000	89,000,000	72,000,000
113. Westvaco Development Corp. (2)	Summerville, S.C.	0	89,000,000	89,000,000	76,000,000
114. Sun Studs Inc. (1)	Roseburg, Ore.	0	88,218,000	88,218,000	86,359,000
115. Collins Pine Co. (2)	Portland, Ore.	19,000,000	68,900,000	87,900,000	76,871,000
116. Sagebrush Sales Co. (4)	Albuquerque, N.M.	0	87,000,000	87,000,000	70,000,000
117. Zeidler Forest Industries Ltd. (3)	Edmonton, Alta.	0	85,580,000	85,580,000	45,810,000
118. Bowater Lumber Co. (1)	Albertville, Ala.	0	85,000,000	85,000,000	79,000,000

Company name & number of mills	Headquarters	'84 Hardwood	'84 Softwood	'84 Total	'83 Total
119. American Can Co. (1)	Greenwich, Conn.	0	82,000,000	82,000,000	81,763,000
120. Manke Lumber Co. Inc. (2)	Tacoma, Wash.	0	81,159,936	81,159,936	82,586,313
121. P&M Cedar Products (4)	Stockton, Calif.	0	80,477,000	80,477,000	75,000,000
122. Federated Cooperatives Ltd. (2)	Canoe, B.C.	0	79,220,000	79,220,000	112,420,000
123. Gregory Timber Resources Inc. (2)	Glendale, Ore.	0	77,000,000	77,000,000	52,688,500
124. La Scierie Taschereau (1)	Taschereau, Que.	0	76,000,000	76,000,000	70,000,000
125. Apollo Forest Products Ltd. (1)	Fort Saint James, B.C.	0	73,918,036	73,918,036	82,461,071
126. Maibec Industries Inc. (2)	Sainte Foy, Que.	0	73,000,000	73,000,000	63,000,000
127. Temple-Eastex (1)	Diboll, Texas	0	73,000,000	73,000,000	65,000,000
128. Gregory Industries Ltd. (2)	Delta, B.C.	0	72,000,000	72,000,000	63,000,000
129. Hankins Lumber Co. Inc. (2)	Grenada, Miss.	0	71,936,258	71,936,258	53,451,921
130. Chesapeake Corp. (4)	West Point, Va.	32,244,907	39,099,263	71,344,170	57,843,726
131. Daaquam Lumber Ltd. (2)	Daaquam, Que.	0	71,274,080	71,274,080	47,648,167
132. Brand-S Corp. (1)	Corvallis, Ore.	0	70,000,000	70,000,000	62,000,000
133. Fraser Inc. (2)	Edmunston, N.B.	0	70,000,000	70,000,000	55,000,000
134. Avison Lumber Co. (4)	Molalla, Ore.	0	68,773,000	68,773,000	62,495,000
135. Great West Timber Ltd. (1)	Thunder Bay, Ont.	0	68,520,000	68,520,000	64,225,000
136. Scott Paper Co. (2)	Philadelphia, Pa.	0	68,500,000	68,500,000	—
137. Raven Lumber Ltd. (1)	Campbell River, B.C.	0	68,000,000	68,000,000	59,000,000
138. Allied Forest Products (4)	Portland, Ore.	0	67,963,141	67,963,141	74,000,000
139. Anderson-Tully Co. (3)	Memphis, Tenn.	67,720,797	0	67,720,797	66,397,221
140. Ellingson Lumber Co. (1)	Baker, Ore.	0	66,466,258	66,466,258	60,828,010
141. The Langdale Co. (2)	Valdosta, Ga.	0	65,194,289	65,194,289	72,101,187
142. Scierie St.-Michel Inc. (1)	St.-Michel-des-Saints, Que.	0	65,000,000	65,000,000	75,000,000
143. Del-Cook Lumber Co. (3)	Adel, Ga.	0	64,796,000	64,796,000	54,657,000
144. Erickson Lumber Co. (1)	Marysville, Calif.	0	64,049,000	64,049,000	42,642,000
145. Cipa Lumber Co. Ltd. (1)	Vancouver, B.C.	0	64,000,000	64,000,000	62,000,000
146. Ochoco and Malheur Lumber Co. (2)	Prineville, Ore.	0	63,309,000	63,309,000	36,206,000
147. Nova Lumber Co. Ltd. (1)	N. Vancouver, B.C.	0	63,000,000	63,000,000	56,000,000
148. Portac Inc. (1)	Tacoma, Wash.	0	63,000,000	63,000,000	48,000,000
149. Harrigan Lumber Co. Inc. (1)	Monroeville, Ala.	0	61,835,838	61,835,838	61,682,533
150. Schmidbauer Lumber Co. (2)	Eureka, Calif.	0	61,595,000	61,595,000	57,690,000
151. Modoc Lumber Co. (1)	Klamath Falls, Ore.	0	61,580,000	61,580,000	65,865,000
152. New South Forest Industries (1)	Conway, S.C.	0	61,524,707	61,524,707	55,054,246
153. Davidson Industries Inc. (2)	Mapleton, Ore.	0	61,512,000	61,512,000	56,025,000
154. L&M Lumber Ltd. (1)	Vanderhoof, B.C.	0	61,258,357	61,258,357	55,387,218
155. Merritt Bros. Lumber Co. Inc. (1)	Priest River, Idaho	0	60,000,000	60,000,000	50,000,000
156. Gorman Bros. Lumber Ltd. (1)	Westbank, B.C.	0	58,000,000	58,000,000	58,000,000
157. Saskatchewan Forest Products Corp. (2)	Prince Albert, Sask.	0	58,000,000	58,000,000	49,000,000
158. Taylor Lumber Co. (1)	Beaverton, Ore.	0	57,000,000	57,000,000	38,100,000
159. Oregon Cedar Products Co. (2)	Springfield, Ore.	0	56,000,000	56,000,000	54,000,000
160. Bond Bros. Sawmill Ltd. (1)	Vanderhoof, B.C.	0	55,000,000	55,000,000	58,000,000
161. Dubreuil Brothers Ltd. (1)	Dubreuilville, Ont.	0	55,000,000	55,000,000	55,000,000
162. Raoul Guerette Inc. (3)	Degelis, Que.	10,000,000	45,000,000	55,000,000	45,000,000
163. Mill and Timber Products Ltd. (1)	Surrey, B.C.	0	55,000,000	55,000,000	53,000,000
164. Sierra Forest Products (1)	Terra Bella, Calif.	0	55,000,000	55,000,000	44,000,000
165. Weiers Sawmill Ltd. (1)	Quesnel, B.C.	0	55,000,000	55,000,000	46,000,000
166. Tolleson Lumber Co. Inc. (3)	Perry, Ga.	8,600,000	44,500,000	53,100,000	51,600,000
167. Spruce Falls Power and Paper Co. Ltd. (1)	Kapuskasing, Ont.	0	52,635,000	52,635,000	55,000,000
168. Douglas County Lumber Co. (1)	Roseburg, Ore.	0	52,578,000	52,578,000	44,606,000
169. Gulf Lumber Co. (1)	Mobile, Ala.	0	52,000,000	52,000,000	50,500,000
170. Rogge Lumber Inc. (1)	Wallowa, Ore.	0	51,991,326	51,991,326	48,673,308
171. Spalding and Son Inc. (1)	Grants Pass, Ore.	0	50,775,000	50,775,000	49,123,000
172. Levesque Lumber Co. Ltd. (1)	Hearst, Ont.	0	50,622,726	50,622,726	47,999,549
173. Lumbee Timber Co. Inc. (1)	Laurinburg, N.C.	0	50,445,000	50,445,000	50,475,000
174. Owens and Hurst Lumber Co. (1)	Eureka, Mont.	0	50,180,000	50,180,000	35,393,000
175. Groot Logging Ltd. (1)	Smithers, B.C.	0	50,000,000	50,000,000	49,000,000
176. Marys River Lumber Co. (2)	Corvallis, Ore.	0	50,000,000	50,000,000	45,000,000
177. Wetsel-Oviatt Lumber Co. (1)	Folsom, Calif.	0	48,360,000	48,360,000	43,878,190
178. Aspen Planers Ltd. (1)	Merritt, B.C.	0	48,000,000	48,000,000	45,000,000
179. Buchanan Hardwoods Inc. (5)	Selma, Ala.	48,000,000	0	48,000,000	48,000,000
180. Juniper Lumber Co. Ltd. (2)	Juniper, N.B.	0	48,000,000	48,000,000	31,600,000
181. C&D Lumber Co. (1)	Riddle, Ore.	0	47,480,000	47,480,000	34,358,000
182. Malette Lumber, Div. of Waferboard Corp. (1)	Timmins, Ont.	0	47,413,000	47,413,000	55,206,000
183. Buse Timber and Sales Inc. (1)	Everett, Wash.	0	47,000,000	47,000,000	45,111,000
184. Elk Lake Planing Mill Ltd. (1)	Elk Lake, Ont.	0	46,557,202	46,557,202	44,805,036
185. Vanport Manufacturing Inc. (1)	Boring, Ore.	0	45,753,000	45,753,000	42,474,000
186. Swanson-Superior Forest Products Inc. (1)	Noti, Ore.	0	45,669,000	45,669,000	38,849,000
187. Navajo Forest Products Inc. (1)	Navajo, N.M.	0	45,415,000	45,415,000	36,455,000
188. Gilchrist Timber Co. (1)	Gilchrist, Ore.	0	45,400,000	45,400,000	44,900,000
189. Wrangell Forest Products Ltd. (1)	Wrangell, Alaska	0	45,379,463	45,379,463	52,833,000
190. Hudson Lumber Co. (2)	Anderson, Calif.	0	45,224,000	45,224,000	31,263,000
191. Friesen Lumber Co. (1)	Saint Helens, Ore.	0	45,067,000	45,067,000	33,700,000
192. Warm Springs Forest Products Industries (1)	Warm Springs, Ore.	0	45,013,631	45,013,631	51,293,440
193. Buchanan Lumber (1)	High Prairie, Alta.	0	45,000,000	45,000,000	30,000,000

Company name & number of mills	Headquarters	'84 Hardwood	'84 Softwood	'84 Total	'83 Total
194. Weico Lumber Co. (1)	Marysville, Wash.	0	45,000,000	45,000,000	45,000,000
195. Shuqualak Lumber Co. Inc. (1)	Shuqualak, Miss.	0	44,000,000	44,000,000	40,000,000
196. Kinzua Corp. (1)	Heppner, Ore.	0	43,000,000	43,000,000	42,000,000
197. Bibler Lumber Co. (1)	Russelville, Ark.	0	42,000,000	42,000,000	42,000,000
198. Madawaska Lumber (3)	Carleton, Que.	0	42,000,000	42,000,000	36,000,000
199. White Swan Lumber Co. Inc. (1)	White Swan, Wash.	0	42,000,000	42,000,000	43,050,907
200. Caffall Bros. Forest Products Inc. (2)	Wilsonville, Ore.	0	41,175,765	41,175,765	40,629,585
201. Arcata Redwood Co. (1)	Arcata, Calif.	0	41,000,000	41,000,000	33,000,000
202. Snider Industries (1)	Marshall, Texas	0	40,000,000	40,000,000	40,000,000
203. United Sawmill Ltd. (1)	Hearst, Ont.	0	40,000,000	40,000,000	54,000,000
204. Pine Products Corp. (2)	Prineville, Ore.	0	39,960,000	39,960,000	37,500,000
205. Paul Bunyan Lumber Co. (1)	Anderson, Calif.	0	39,915,000	39,915,000	40,328,000
206. Jordan Lumber and Supply Inc. (1)	Mt. Gilead, N.C.	0	38,500,000	38,500,000	28,000,000
207. Balfour Lumber Co. (1)	Thomasville, Ga.	0	38,206,000	38,206,000	42,249,000
208. Layman Lumber Co. (1)	Naches, Wash.	0	38,150,000	38,150,000	32,506,000
209. AT&N Lumber Service Inc. (3)	York, Ala.	0	38,000,000	38,000,000	36,000,000
210. Snider Lumber Products Co. (2)	Turlock, Calif.	0	37,607,357	37,607,357	32,143,843
211. Pyramid Mountain Lumber Inc. (1)	Seeley Lake, Mont.	0	37,525,571	37,525,571	35,346,850
212. Burgin Lumber Co. Inc. (1)	Cuthbert, Ga.	3,640,000	33,760,000	37,400,000	—
213. Lake Region Lumber Co. (1)	Casco, Maine	0	36,724,315	36,724,315	39,945,003
214. Pinecrest Lumber Co. (1)	Plumerville, Ark.	0	36,699,000	36,699,000	41,660,000
215. SDS Lumber Co. (2)	Bingen, Wash.	0	36,600,000	36,600,000	33,738,000
216. Mayr Bros. Logging Co. (2)	Hoquiam, Wash.	0	36,300,000	36,300,000	30,600,000
217. Bearden Lumber Co. (2)	Bearden, Ark.	36,000,000	0	36,000,000	36,000,000
218. J&J Log and Lumber Corp. (2)	Dover Plains, N.Y.	36,000,000	0	36,000,000	36,000,000
219. M. W. Smith Lumber Co. (1)	Jackson, Ala.	0	36,000,000	36,000,000	32,000,000
220. P. E. Barnes Lumber Co. (4)	Hamburg, Ark.	35,990,785	0	35,990,785	26,030,270
221. Keadle Lumber Enterprises (2)	Thomaston, Ga.	9,360,000	26,200,000	35,560,000	33,800,000
222. Chassé Inc. (1)	Ste-Marie Beauce, Que.	0	35,490,489	35,490,489	32,208,642
223. Charles Ingram Lumber Co. Inc. (2)	Effingham, S.C.	0	35,046,000	35,046,000	33,770,000
224. Beau-J Mills Ltd. (2)	Malakwa, B.C.	0	35,000,000	35,000,000	35,016,000
225. T. R. Miller Mill Co. Inc. (2)	Brewton, Ala.	0	35,000,000	35,000,000	35,000,000
226. Webster Industries (5)	Wayzata, Minn.	35,000,000	0	35,000,000	38,000,000
227. Nagel Lumber Co. Inc. (2)	Land O' Lakes, Wis.	19,147,238	15,538,199	34,685,437	34,489,108
228. Bisson Bisson Inc. (1)	Matagami, Que.	0	34,654,201	34,654,201	35,444,602
229. Columbus Lumber Co. (1)	Brookhaven, Miss.	0	34,000,000	34,000,000	30,000,000
230. Kitchens Bros. Manufacturing Co. Inc. (3)	Utica, Miss.	33,532,987	0	33,532,987	28,658,751
231. Galloway Lumber Co. Ltd. (1)	Galloway, B.C.	0	33,311,530	33,311,530	46,288,950
232. Guy Bennett Lumber Co. (1)	Clarkston, Wash.	0	33,000,000	33,000,000	34,000,000
233. Connor Forest Industries Inc. (4)	Wausau, Wis.	30,000,000	3,000,000	33,000,000	30,000,000
234. Allen Logging Co. (1)	Forks, Wash.	0	32,945,286	32,945,286	34,626,436
235. Lulumco Inc. (1)	Luceville, Que.	0	32,942,473	32,942,473	32,560,791
236. Decker Lake Forest Products Ltd. (1)	Burns Lake, B.C.	0	32,042,000	32,042,000	33,067,000
237. Anthony Forest Products Co. (2)	El Dorado, Ark.	0	32,000,000	32,000,000	32,000,000
238. Kimberly-Clark Corp. (1)	Coosa Pines, Ala.	0	31,200,000	31,200,000	77,085,000
239. North Florida Lumber Co. Inc. (1)	Graceville, Fla.	0	31,000,000	31,000,000	28,000,000
240. Malheur Lumber Co. (1)	John Day, Ore.	0	30,714,000	30,714,000	—
241. Freemont Sawmill Co. (2)	Lakeview, Ore.	0	30,000,000	30,000,000	30,307,926
242. Griffin Lumber Co. (2)	Cordele, Ga.	0	30,000,000	30,000,000	31,391,398
243. A&L Lafreniere Lumber Ltd. (1)	Chapleau, Ont.	0	30,000,000	30,000,000	25,576,000
244. Martin Timber Co. Inc. (1)	Castor, La.	0	30,000,000	30,000,000	30,000,000
245. Metcalf Lumber Co. Inc. (1)	Thomasville, Ga.	0	30,000,000	30,000,000	15,000,000
246. Murray Bros. Lumber Ltd. (1)	Madawaska, Ont.	21,000,000	9,000,000	30,000,000	25,000,000
247. Scierie Landrienne Inc. (1)	Landrienne, Que.	0	30,000,000	30,000,000	35,000,000
248. Superior Lumber Co. (1)	Glendale, Ore.	0	30,000,000	30,000,000	30,000,000
249. Seattle-Snohomish Mill Co. Inc. (1)	Snohomish, Wash.	0	29,430,000	29,430,000	18,932,000
250. Marcel Lauzon Inc. (1)	E. Hereford, Que.	0	29,334,213	29,334,213	29,494,544
251. Hi-Ridge Lumber Co. (1)	Yreka, Calif.	0	28,412,000	28,412,000	29,111,000
252. Gray Lumber Co. (1)	Waverly, Va.	0	28,119,392	28,119,392	28,179,925
253. Big Valley Lumber Co. Inc. (1)	Bieber, Calif.	0	28,000,000	28,000,000	24,000,000
254. Clemons Bros. Lumber Co. (1)	Amite, La.	0	28,000,000	28,000,000	28,000,000
255. Cliffs Forest Products Co. (1)	Iron Mountain, Mich.	25,805,000	1,758,000	27,563,000	30,690,000
256. Kamiah Mills (1)	Kamiah, Idaho	0	27,499,587	27,499,587	29,742,679
257. Forest Products Inc. (2)	Corbin, Ky.	27,000,000	0	27,000,000	25,000,000
258. H. V. and T. G. Thompson Lumber (1)	Ailey, Ga.	0	27,000,000	27,000,000	27,000,000
259. Cone Lumber Co. (1)	Goshen, Ore.	0	26,510,000	26,510,000	32,243,000
260. East Alabama Lumber Co. (1)	LaFayette, Ala.	0	26,177,926	26,177,926	18,295,004
261. M. C. Dixon Lumber Co. Inc. (1)	Eufaula, Ala.	0	26,177,000	26,177,000	22,116,000
262. Broughton Lumber Co. (1)	Underwood, Wash.	0	26,000,000	26,000,000	21,378,000
263. Varn Wood Products Co. (1)	Hoboken, Ga.	0	25,883,904	25,883,904	21,574,884
264. Beaver Lumber Co. (1)	Clatskanie, Ore.	0	25,869,923	25,869,923	31,392,602
265. Inter-State Lumber Co. Inc. (2)	Kingwood, W. Va.	12,500,000	12,500,000	25,000,000	28,000,000
266. Walker Bros. Lumber Co. Inc. (1)	Huntsville, Texas	0	25,000,000	25,000,000	25,000,000
267. Moore Mill and Lumber Co. (2)	Bandon, Ore.	0	24,983,000	24,983,000	23,404,094
268. St. Johns Forest Products Co. (1)	Portland, Ore.	0	24,446,204	24,446,204	18,758,786

Company name & number of mills	Headquarters	'84 Hardwood	'84 Softwood	'84 Total	'83 Total
269. Manitoba Forestry Resources Ltd. (1)	The Pas, Man.	0	24,000,000	24,000,000	25,000,000
270. J. E. Martel and Sons Lumber (1)	Chapleau, Ont.	0	24,000,000	24,000,000	25,000,000
271. C. M. Tucker Lumber Corp. (1)	Pageland, S.C.	0	24,000,000	24,000,000	24,000,000
272. Crane Mills (1)	Corning, Calif.	0	23,927,529	23,927,529	21,805,370
273. Moose River Lumber Co. Inc. (1)	Jackman, Maine	0	23,299,246	23,299,246	15,400,177
274. Averitt Lumber Co. (3)	Clarksville, Tenn.	23,000,000	0	23,000,000	19,000,000
275. Rajala Co. (5)	Deer River, Minn.	15,393,651	7,529,752	22,923,403	24,000,000
276. Tangfeldt Wood Products (1)	Eugene, Ore.	0	22,500,000	22,500,000	24,500,000
277. Wade Wood Inc. (1)	Wade, N.C.	0	22,500,000	22,500,000	19,000,000
278. Custer Lumber Co. (1)	Custer, S.D.	0	22,000,000	22,000,000	21,000,000
279. Ramsey Lumber Co. Inc. (2)	Suffolk, Va.	0	22,000,000	22,000,000	18,000,000
280. Michigan-California Lumber Co. (1)	Camino, Calif.	0	21,875,000	21,875,000	37,968,000
281. Doyle Lumber Inc. (1)	Martinsville, Va.	4,111,654	17,732,225	21,843,879	19,403,000
282. Hull-Oakes Lumber Co. (1)	Monroe, Ore.	0	21,567,225	21,567,225	19,586,623
283. Delta Cedar Products Ltd. (1)	Delta, B.C.	0	21,215,000	21,215,000	21,572,000
284. Cuddeback Lumber Co. (1)	Eugene, Ore.	0	21,000,000	21,000,000	20,000,000
285. Gulf States Paper Corp. (1)	Tuscaloosa, Ala.	0	21,000,000	21,000,000	19,000,000
286. H. G. Toler and Son Lumber Co. Inc. (1)	Leola, Ark.	75,000	20,783,397	20,858,397	20,994,487
287. Spray Lake Sawmills (1980) Ltd. (1)	Cochrane, Alta.	0	20,831,492	20,831,492	19,737,465
288. Cambria Forest Industries (1)	Newcastle, Wyo.	0	20,745,000	20,745,000	20,140,000
289. Chiloquin Forest Products Inc. (1)	Bend, Ore.	0	20,630,000	20,630,000	13,880,000
290. Clermond Hamel Ltd. (1)	St. Ephrem Beauce, Que.	2,023,000	18,404,300	20,427,300	15,820,600
291. AJD Forest Products Inc. (1)	Grayling, Mich.	13,000,000	7,000,000	20,000,000	17,000,000
292. Colandor Pine Corp. (1)	Reno, Nev.	0	20,000,000	20,000,000	20,000,000
293. Cascade Locks Lumber Co. (1)	Cascade Locks, Ore.	0	20,000,000	20,000,000	20,000,000
294. Cedar Lumber Inc. (1)	Mill City, Ore.	0	20,000,000	20,000,000	26,000,000
295. H. W. Culp Lumber Co. (1)	New London, N.C.	0	20,000,000	20,000,000	18,000,000
296. Kitwanga Lumber Co. Ltd. (1)	Kitwanga, B.C.	0	20,000,000	20,000,000	16,000,000
297. Potomac Supply Corp. (1)	Kinsale, Va.	8,000,000	12,000,000	20,000,000	20,000,000
298. Zip-O Lumber Co. (1)	Eugene, Ore.	0	20,000,000	20,000,000	18,500,000
299. Neiman Sawmills Inc. (1)	Hulett, Wyo.	0	19,615,176	19,615,176	18,084,858
300. Paxport Mills Inc. (1)	Tacoma, Wash.	1,909,376	17,579,538	19,488,914	18,878,996
301. Sundance Lumber Co. Inc. (1)	Springfield, Ore.	0	19,306,000	19,306,000	19,556,000
302. J. V. Wells Inc. (1)	Sharptown, Md.	0	19,216,422	19,216,422	16,250,000
303. William Milne and Sons Ltd. (1)	Temagami, Ont.	0	19,100,000	19,100,000	20,200,000
304. Beadles Lumber Co. (1)	Moultrie, Ga.	0	19,000,000	19,000,000	18,600,000
305. Sam Mabry Lumber Co. (1)	Liberty, Miss.	0	19,000,000	19,000,000	15,700,000
306. T. J. Moss Lumber Co. Inc. (3)	Rogersville, Ala.	19,000,000	0	19,000,000	18,500,000
307. Collum's Lumber Mill Inc. (1)	Allendale, S.C.	0	18,951,417	18,951,417	14,405,730
308. Greensboro Lumber Co. (1)	Greensboro, Ga.	0	18,500,000	18,500,000	22,000,000
309. Flippo Lumber Corp. (1)	Doswell, Va.	0	18,231,095	18,231,095	17,464,187
310. Hamel Forest Products (4)	Vesper, Wis.	13,500,000	4,500,000	18,000,000	11,728,000
311. Troy Lumber Co. (1)	Troy, N.C.	0	18,000,000	18,000,000	13,000,000
312. Consolidated Pine Inc. (1)	Prineville, Ore.	0	17,688,980	17,688,980	16,898,940
313. Pine Mountain Lumber Co. (1)	Yreka, Calif.	82,000	17,600,000	17,682,000	12,894,000
314. Burt Lumber Co. Inc. (1)	Washington, Ga.	0	17,607,724	17,607,724	11,740,734
315. Newman Lumber Co. Inc. (2)	Woodsville, N.H.	0	17,500,000	17,500,000	17,500,000
316. Big Creek Lumber Co. (1)	Davenport, Calif.	0	17,475,195	17,475,195	16,892,199
317. McShan Lumber Co. Inc. (1)	McShan, Ala.	0	17,200,000	17,200,000	17,000,000
318. Herbert Lumber Co. (1)	Riddle, Ore.	0	17,080,000	17,080,000	16,336,000
319. Cersosimo Lumber Co. Inc. (3)	Brattleboro, Vt.	6,700,000	10,300,000	17,000,000	20,000,000
320. Spruce Products Ltd. (2)	Winnipeg, Man.	2,000,000	15,000,000	17,000,000	17,000,000
321. Arkansas Oak Flooring Co. (2)	Pine Bluff, Ark.	16,818,407	0	16,818,407	14,066,686
322. Claude Howard Lumber Co. Inc. (1)	Statesboro, Ga.	0	16,752,400	16,752,400	16,164,272
323. Feldman Wood Products Co. (1)	New Hyde Park, N.Y.	0	16,729,000	16,729,000	17,535,000
324. Bear Paw Timber Corp. (4)	Fryeburg, Maine	16,500,000	0	16,500,000	15,400,000
325. Seaman Timber Co. Inc. (3)	Montevallo, Ala.	14,625,000	1,625,000	16,250,000	12,000,000
326. Mebane Lumber Co. (1)	Mebane, N.C.	0	16,095,809	16,095,809	14,064,990
327. A. B. Carroll Lumber Co. Inc. (1)	Hurtsboro, Ala.	0	16,000,000	16,000,000	15,000,000
328. Vaughn Lumber Co. (1)	Forsyth, Ga.	3,000,000	13,000,000	16,000,000	16,000,000
329. T&S Hardwoods Inc. (1)	Milledgeville, Ga.	15,768,324	0	15,768,324	13,886,368
330. Monticello Hardwood Inc. (4)	Monticello, Miss.	15,695,000	0	15,695,000	5,620,000
331. James MacLaren Industries Inc. (1)	Thurso, Que.	13,225,000	2,438,000	15,663,000	8,371,000
332. Rebel Lumber Co. (1)	Marshville, N.C.	15,500,000	0	15,500,000	14,900,000
333. Alton Packaging Corp. (1)	Alton, Ill.	0	15,209,987	15,209,987	15,139,327
334. Atchley Lumber and Supply Inc. (1)	Trinity, Texas	0	15,000,000	15,000,000	8,000,000
335. Copper Springs Lumber Co. (1)	Birmingham, Ala.	0	15,000,000	15,000,000	15,000,000
336. Hanna Manufacturing (1)	Winnfield, La.	15,000,000	0	15,000,000	9,000,000
337. Pate Lumber Co. Inc. (1)	Carrollton, Ala.	0	15,000,000	15,000,000	15,000,000
338. Swift Lumber Inc. (1)	Atmore, Ala.	0	15,000,000	15,000,000	13,300,000
339. Keller Lumber Co. (1)	Roseburg, Ore.	0	14,988,689	14,988,689	17,495,769
340. Kimball International Inc. (3)	Jasper, Ind.	14,977,065	0	14,977,065	16,153,224
341. Chesterfield Lumber Co. (1)	Darlington, S.C.	0	14,872,386	14,872,386	14,879,074
342. Timberline Lumber Inc. (1)	Weippe, Idaho	0	14,695,133	14,695,133	11,574,650
343. Perry Lumber Co. Inc. (1)	Perry, Fla.	0	14,580,000	14,580,000	14,350,000

Company name & number of mills	Headquarters	'84 Hardwood	'84 Softwood	'84 Total	'83 Total
344. Thomas and Miller Lumber Co. (1)	Linden, Ala.	0	14,560,000	14,560,000	14,560,000
345. Wood Reels Inc. (1)	Hartselle, Ala.	0	14,400,000	14,400,000	14,400,000
346. Elliott Sawmilling Co. Inc. (1)	Estill, S.C.	0	14,366,602	14,366,602	13,595,983
347. Menominee Tribal Enterprises (1)	Neopit, Wis.	7,298,753	7,027,678	14,326,431	13,451,375
348. J. W. Jones Lumber Co. Inc. (1)	Elizabeth City, N.C.	4,208,704	9,841,345	14,050,049	12,618,535
349. Fred Netterville Lumber Co. (1)	Woodville, Miss.	14,000,000	0	14,000,000	14,000,000
350. Williams Lumber Co. Inc. (1)	Roper, N.C.	14,000,000	0	14,000,000	20,000,000
351. Fiest Hardwoods Inc. (1)	Newton Falls, Ohio	13,902,411	0	13,902,411	12,314,154
352. Almond Bros. Lumber and Supply Inc. (1)	Coushatta, La.	0	13,560,655	13,560,655	13,340,300
353. Hutchins Lumber Inc. (1)	Wiappe, Idaho	0	13,471,966	13,471,966	16,986,301
354. Jackson Sawmill Co. Inc. (1)	Jackson, Ala.	0	13,125,000	13,125,000	12,500,000
355. Barnes Manufacturing Co. (1)	Kenbridge, Va.	8,170,509	4,902,921	13,073,430	11,188,832
356. Bellerive-Ka'N'Enda Wood Products (1)	Mont-Laurier, Que.	13,000,000	0	13,000,000	10,000,000
357. Leesville Lumber Co. (1)	Leesville, La.	0	13,000,000	13,000,000	—
358. Flodin Lumber and Manufacturing Co. (1)	Plains, Mont.	0	12,934,000	12,934,000	16,904,000
359. Pruitt Lumber Co. Inc. (1)	Louisburg, N.C.	1,348,227	11,419,082	12,767,309	11,871,471
360. Harris Pine Mills (1)	Pendleton, Ore.	0	12,636,435	12,636,435	19,000,000
361. Wiergate Lumber Co. Inc. (1)	Wiergate, Texas	0	12,600,000	12,600,000	13,680,000
362. Battle Lumber Co. (2)	Wadley, Ga.	12,500,000	0	12,500,000	12,500,000
363. Fleming Lumber Co. (1)	Crestview, Fla.	0	12,500,000	12,500,000	11,000,000
364. Buddy Bean Lumber Co. (1)	Hot Springs, Ark.	0	12,000,000	12,000,000	12,000,000
365. Carlotta Lumber Co. (2)	Carlotta, Calif.	0	12,000,000	12,000,000	14,060,000
366. Coulbourn Lumber Co. (1)	Windsor, N.C.	0	12,000,000	12,000,000	10,500,000
367. C. E. Elder Lumber Co. (1)	Petersburg, Va.	0	12,000,000	12,000,000	—
368. J. M. Jones Lumber Co. Inc. (1)	Natchez, Miss.	12,000,000	0	12,000,000	13,000,000
369. Lytton Lumber Ltd. (1)	Lytton, B.C.	0	12,000,000	12,000,000	12,000,000
370. Hubert Moore Lumber Co. Inc. (1)	Alapaha, Ga.	0	12,000,000	12,000,000	12,000,000
371. Ocala Lumber Sales Co. (1)	Ocala, Fla.	0	12,000,000	12,000,000	12,000,000
372. Pacific Studs (1)	Cimarron, N.M.	0	12,000,000	12,000,000	16,500,000
373. Pitt Timber Ltd. (1)	Port Coquitlam, B.C.	0	12,000,000	12,000,000	12,200,000
374. W. M. Sheppard Lumber Co. Inc. (1)	Brooklet, Ga.	0	12,000,000	12,000,000	10,000,000
375. E. Sondheimer Co. (1)	Sondheimer, La.	12,000,000	0	12,000,000	10,000,000
376. Sterling Lumber Co. (1)	Goodwater, Ala.	4,200,000	7,800,000	12,000,000	12,000,000
377. Suwannee Lumber Co. (1)	Cross City, Fla.	0	12,000,000	12,000,000	12,000,000
378. Umphlett Lumber Co. (1)	Moncks Corner, S.C.	0	11,946,000	11,946,000	11,024,000
379. McRae Mills Ltd. (2)	Whitney, Ont.	7,320,000	4,500,000	11,820,000	9,500,000
380. Parton Lumber Co. Inc. (1)	Rutherfordton, N.C.	5,800,000	6,000,000	11,800,000	10,500,000
381. Canyon Lumber Co. Inc. (1)	Everett, Wash.	0	11,500,000	11,500,000	9,500,000
382. M. J. Corley and Sons Sawmill Inc. (1)	Lexington, S.C.	500,000	11,000,000	11,500,000	11,000,000
383. East Perry Lumber Co. (1)	Frohna, Mo.	11,500,000	0	11,500,000	11,500,000
384. Conrad Poulin and Fils Ltd. (1)	Montmagny, Que.	300,000	11,200,000	11,500,000	15,000,000
385. C&S Lumber Co. (1)	Carthage, Ark.	11,497,063	0	11,497,063	11,833,246
386. Bowater Mersey Paper Co. Ltd. (1)	Liverpool, N.S.	23,035	11,471,941	11,494,976	12,515,300
387. Southland Forest Products (1)	Kershaw, S.C.	11,380,000	0	11,380,000	9,640,000
388. H. S. Hofler and Son Lumber Co. (1)	Sunbury, N.C.	0	11,200,000	11,200,000	12,045,187
389. Semac Industries Inc. (5)	Millersburg, Ohio	11,155,000	0	11,155,000	11,375,000
390. D. B. Arant Inc. (1)	New Bern, N.C.	0	11,000,000	11,000,000	11,000,000
391. Hinchcliff Products Co. (2)	Strongsville, Ohio	11,000,000	0	11,000,000	6,083,000
392. Reed and Sons Hardwood Inc. (1)	Monroe, La.	10,927,828	0	10,927,828	9,386,044
393. V. P. Kiser Lumber Co. Inc. (1)	Bowman, S.C.	0	10,400,000	10,400,000	10,000,000
394. Toney Lumber Co. Inc. (1)	Louisburg, N.C.	0	10,394,960	10,394,960	9,706,503
395. Zosel Lumber Co. (1)	Oroville, Wash.	0	10,367,000	10,367,000	11,113,000
396. Great Western Lumber Co. (1)	Everson, Wash.	2,320,000	7,950,000	10,270,000	9,880,000
397. Beasley Lumber Products (1)	Scotland Neck, N.C.	0	10,200,000	10,200,000	9,980,000
398. Tigerton Lumber Co. (1)	Tigerton, Wis.	10,000,000	200,000	10,200,000	9,000,000
399. Godfrey Lumber Co. Inc. (1)	Statesville, N.C.	2,000,000	8,000,000	10,000,000	7,000,000
400. Highland Lumber Co., Div. United Timber (1)	Dixfield, Maine	0	10,000,000	10,000,000	10,000,000
401. Keener Lumber Co. (1)	Clinton, N.C.	0	10,000,000	10,000,000	10,000,000
402. Koppers Co. Inc., Forest Products Group (1)	Pittsburgh, Pa.	8,800,000	1,200,000	10,000,000	8,000,000
403. Mount Yonah Lumber Co. (1)	Cleveland, Ga.	1,000,000	9,000,000	10,000,000	10,000,000
404. G&S Lumber Co. Inc. (1)	Nacogdoches, Texas	9,825,960	0	9,825,960	8,689,698
405. Paul Davis Inc. (2)	Amite, La.	9,382,204	150,000	9,532,204	7,537,447
406. J. W. Kelly Enterprises Inc. (3)	Pittsfield, Mass.	9,300,000	0	9,300,000	12,672,872
407. Dean Lumber Co. (1)	Gilmer, Texas	4,469,484	4,813,704	9,283,188	9,663,334
408. Sheldon Lumber Co. Inc. (1)	Toano, Va.	2,254,000	6,989,000	9,243,000	7,173,000
409. Butler Lumber Co. Inc. (1)	Chase City, Va.	0	9,000,000	9,000,000	9,500,000
410. Johnston Lumber Co. (1)	North Wilkesboro, N.C.	5,000,000	4,000,000	9,000,000	9,500,000
411. Scotch Lumber Co. (1)	Fulton, Ala.	0	9,000,000	9,000,000	8,000,000
412. W. L. Sherrod Lumber Co. Inc. (1)	Greenville, Fla.	0	9,000,000	9,000,000	9,000,000
413. R. A. Yancey Lumber Corp. (1)	Crozet, Va.	1,000,000	8,000,000	9,000,000	8,800,000
414. Augusta Lumber and Supply Inc. (3)	Staunton, Va.	8,750,000	0	8,750,000	6,250,000
415. Chapman Hardwoods Inc. (1)	Camden, Ala.	8,500,000	0	8,500,000	8,500,000
416. Foster Lumber Co. (1)	Shiloh, Ga.	8,368,000	0	8,368,000	7,673,776
417. J. P. Lester Sawmill Inc. (1)	Glenwood, Ala.	8,221,381	0	8,221,381	7,356,513
418. Indiana Wood Products (1)	Middlebury, Ind.	8,070,210	0	8,070,210	8,583,000

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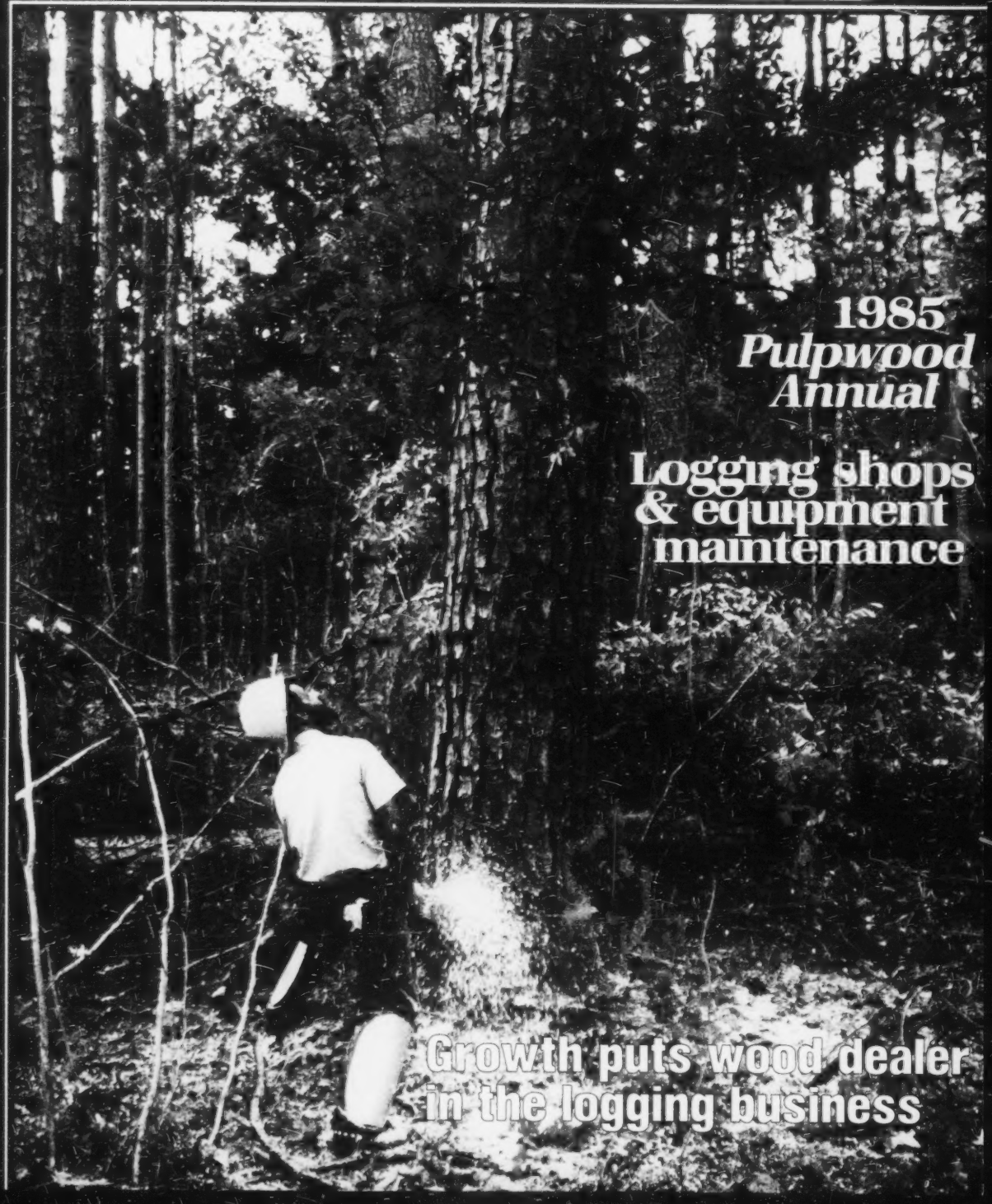
AUGUST 1985

FOREST INDUSTRIES

LOGGING/PULPWOOD/FORESTRY/LUMBER/PANELS



1985 *Pulpwood Annual*

Logging shops & equipment maintenance

Growth puts wood dealer in the logging business

1985 Volume 112 Number 8

AUGUST

Pulpwood Annual

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Total service commitment ensures steady wood flow
Willie Welch, a wood dealer in Grove Hill, Ala., has expanded his operation to include a range of services from logging and trucking to site preparation

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'84's stable pulpwood prices are slipping in '85 because of oversupply of chips
As demand for pulp and paper falls and a worldwide glut of market pulp tries to find homes, companies are shutting logyards or putting loggers on quotas. The result: lower prices for pulpwood

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Case studies show that Z-shaped reversible knives can out-perform conventional whole-log chipper knives

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More treelength handling, less offsite chipping, greater use of cranes, and better screening are among current trends in wood handling at mills

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Our readers offer some interesting views about logging shops and equipment maintenance. Loggers say they handle 75% or more of all their machinery repairs

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Construction companies indicate they view forest products industries as a growth area for their maintenance services. But there are obstacles

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Cost-efficient shop gives logger both direct and indirect savings
Gerald Anderson, a veteran logger in Bridgeton, N.C., says that even though most repairs can be performed in the field, a shop is vital to his business

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Exch	Company	Ticker Symbol	Closing Price 6/14/85	Closing Price 7/15/85	Net Chg in Period	% Chg in Period	P/E Ratio	Annual Rate	Div Yield	52 Week High	52 Week Low
OTC	Bohemia Inc.	BOHM	10.75	11.25	.50	4.65	d	.10	.89	12.50	7.75
NYS	Boise Cascade	BCC	47.50	49.50	2.00	4.21	21	1.90	3.84	50.25	32.50
NYS	Bowater Inc.	BOW	21.75	24.00	2.25	10.34	9	.72	3.00	25.88	15.75
NYS	Champion Intl	CHA	22.75	23.88	1.13	4.97	d	.40	1.68	24.75	16.88
NYS	Chesapeake	CSK	34.25	35.00	.75	2.19	10	1.24	3.54	39.50	31.25
OTC	Consol. Paper	CPER	51.00	49.00	-2.00	-3.92	12	1.48	3.02	51.25	25.13
NYS	Crown Zellerbach	ZB	39.75	42.00	2.25	5.66	17	1.00	2.38	44.88	27.88
NYS	Fed. Paper Board	FBO	19.00	19.00	0.00	0.00	9	.70	3.68	27.00	16.63
NYS	Ft. Howard Paper (H)	FHP	72.63	74.13	1.50	2.07	17	1.64	2.21	74.63	53.50
NYS	Georgia-Pacific	GP	23.25	24.50	1.25	5.38	26	.80	3.27	27.38	18.00
ASE	Glatfelter (P.H.) (H)	GLT	32.13	35.75	3.62	11.27	7	.88	2.46	35.75	19.38
NYS	Gr. Northern Nek.	GNN	36.25	40.00	3.75	10.34	10	1.52	3.80	40.25	31.00
NYS	Hammermill	HML	36.50	35.38	-1.12	-3.07	13	1.36	3.84	38.00	25.75
NYS	Intl Paper	IP	49.75	49.38	-.37	-.74	57	2.40	4.86	57.75	46.00
NYS	James River	JR	30.88	33.50	2.62	8.48	11	.56	1.67	34.50	23.75
OTC	Jefferson Smurfit	JJSC	19.38	20.25	.87	4.49	8	.40	1.98	25.25	15.00
NYS	Kimberly-Clark (H)	KMB	57.25	57.75	.50	.87	11	2.32	4.02	59.63	40.00
NYS	Koppers Corp.	KOP	17.75	17.75	0.00	0.00	27	.80	4.51	22.63	17.00
OTC	Longview Fibre	LFBR	23.50	24.00	.50	2.13	13	1.28	5.33	25.75	20.75
NYS	Louisiana-Pacific	LPX	21.50	22.50	1.00	4.65	42	.80	3.56	25.13	17.00
NYS	Mead Corp.	MEA	41.00	43.38	2.38	5.80	10	1.20	2.77	43.38	31.13
OTC	Mosinee Paper	MOSI	12.88	14.00	1.12	8.70	9	.36	2.57	14.63	11.75
NYS	Pacific Lumber	PL	24.50	27.75	3.25	13.27	17	1.20	4.32	29.00	21.38
OTC	Pentair Inc. (H)	PNTA	24.50	30.25	5.75	23.47	11	.68	2.25	30.25	18.38
NYS	Pope & Talbot	POP	19.63	19.75	.12	.61	d	.80	4.05	21.50	15.00
NYS	Potlatch Corp.	PCH	34.75	37.25	2.50	7.19	13	1.56	4.19	38.13	25.75
NYS	Scott Paper Co. (H)	SPP	39.00	40.88	1.88	4.82	10	1.24	3.03	42.13	26.63
OTC	Sonoco Products ***	SONO	24.50	28.00	3.50	14.29	d	0.00	0.00	28.50	18.75
NYS	Southwest Forest	SWF	14.13	13.25	-.88	-6.23	29	0.00	0.00	20.00	11.75
NYS	Stone Container	STO	24.75	28.38	3.63	14.67	10	.60	2.11	39.00	24.00
NYS	Temple-Inland	TIN	34.75	38.13	3.38	9.73	9	.64	1.68	39.50	25.50
NYS	Union Camp	UCC	36.88	37.50	.62	1.68	11	1.64	4.37	41.25	31.63
NYS	Westvaco Corp.	W	36.25	39.00	2.75	7.59	9	1.32	3.38	41.75	33.50
NYS	Weyerhaeuser Co.	WY	29.25	29.50	.25	.85	19	1.30	4.41	34.00	25.88
OTC	Willamette Ind.	WMTT	37.25	42.00	4.75	12.75	9	1.65	3.93	46.25	25.25
Canadian Forest Products Companies											
TOR	Abitibi-Price	—	19.25	18.00	-1.25	-6.49	15	—	—	20.00	8.13
TOR	BC Forest Prod.	—	9.38	9.25	-.13	-1.39	57	.13	1.41	12.50	8.38
TOR	Canfor Ltd.	—	9.63	9.25	-.38	-3.95	d	0.00	0.00	15.50	8.25
TOR	Consol.-Bathurst	—	16.25	17.25	1.00	6.15	14	.60	3.48	18.50	12.63
TOR	Crestbrook	—	8.00	8.75	.75	9.38	70	.05	.57	9.75	7.00
TOR	Crown For. Ind.	—	30.63	30.63	0.00	0.00	d	0.00	0.00	31.50	30.25
TOR	Domtar Inc. !!!	—	18.13	18.75	.62	3.42	8	1.40	7.47	19.88	14.50
MON	Donohue Inc.	—	18.50	17.00	-1.50	-8.11	6	.72	4.24	19.50	14.50
TOR	Great Lakes	—	21.25	20.25	-1.00	-4.71	23	.40	1.98	24.00	19.00
TOR	MacMillan Bloedel	—	21.75	20.63	-1.12	-5.15	—	—	—	29.75	20.50

Market Diary

Most Active Issues

Largest dollar gainer	Pentair Inc.	+$5.75
Largest dollar loser	Consolidated Papers	-$2.00
Largest percentage gainer	Pentair Inc.	+23.47%
Largest percentage loser	Donohue Inc.	-8.11%

Advances, 32; Declines, 10; Unchanged, 3; New highs, 5; New lows, 0

Key

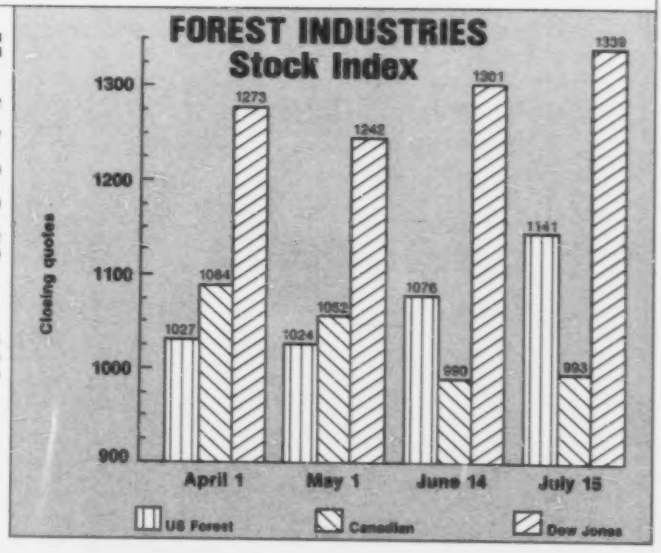
(H) = New High; (L) = New Low; (d) = Deficit.
MON = Montreal; NYS = New York; ASE = American; OTC = Over the Counter; TOR = Toronto.
*** = Sonoco Products Co. Split 2 for 1
!!! = Domtar Inc. Split 2 for 1

All OTC quotes are represented as the bid price.
All Canadian quotes are in Canadian dollars.

	Close 6/14/85	Close 7/15/85	Net Chg in Pd	% Chg in Pd
Forest Industries Stock Index	1076.35	1141.16	64.61	6.02
Canadian Forestry Stock Index	989.93	992.56	2.63	.27
Dow Jones Industrial Avg.	1300.96	1338.60	37.64	2.89
Standard & Poor's 500-Stock Index	189.32	193.29	3.97	2.10
Standard & Poor's 400 Industrials	209.30	212.48	3.18	1.52
NYSE Composite	109.61	112.13	2.52	2.30

Compiled by Nordby International Inc., Boulder, Colo. (303) 449-0326.

The information and statistics contained herein have been obtained from sources believed to be reliable, but are not guaranteed to be all-inclusive or complete. This is not to be construed as an offer or the solicitation of an offer to sell the securities herein mentioned. This information is subject to change without notice.



NOTE

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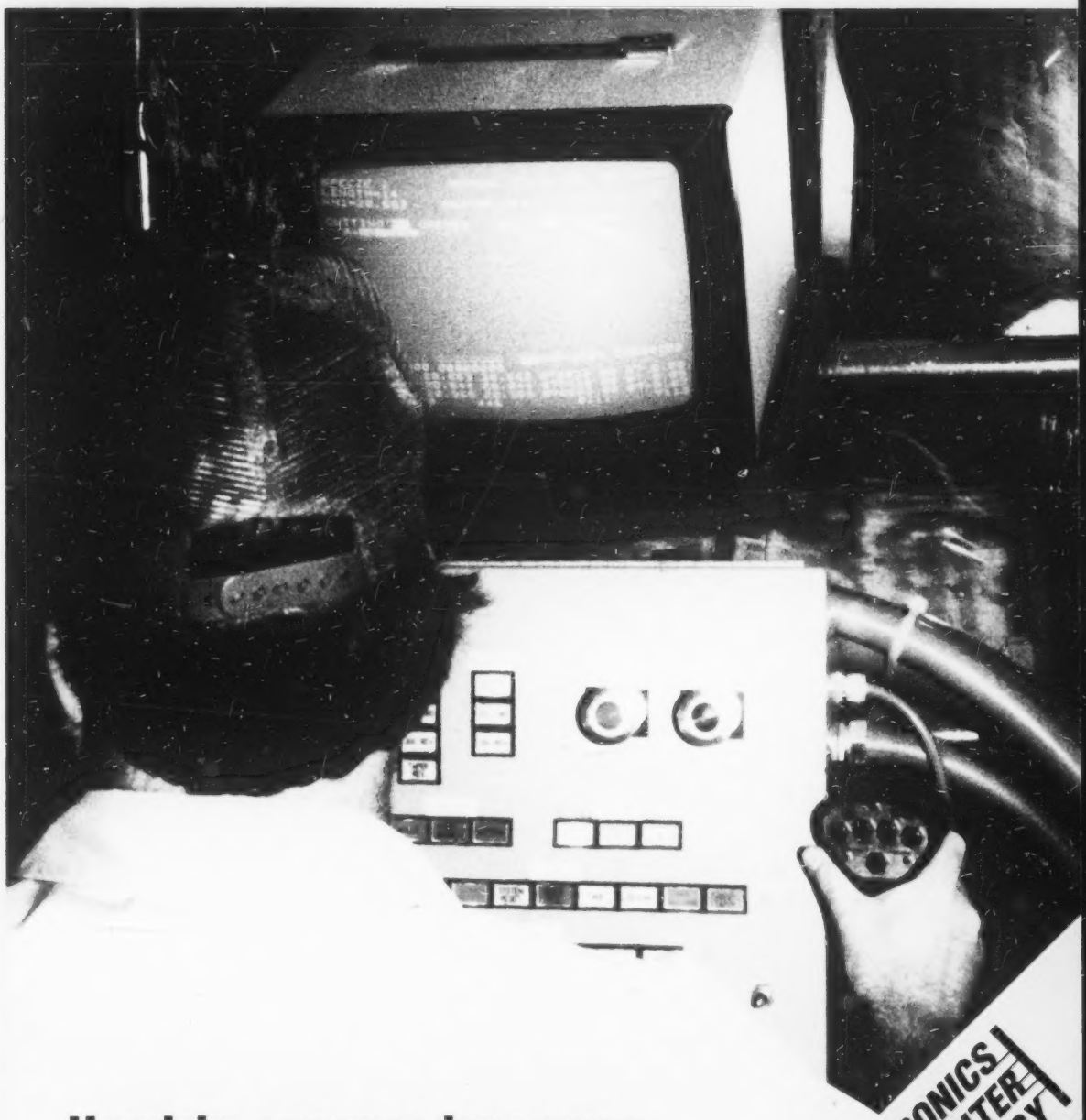
SEPTEMBER 1985

FOREST INDUSTRIES

LOGGING/PULPWOOD/FORESTRY/LUMBER/PANELS



Headrig scanner improves hardwood recovery, output

ELECTRONICS AND COMPUTER TECHNOLOGY

FOREST INDUSTRIES
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Machinery upgrade began return to profitability for family operation
Lawrence Kornegay, of Centreville, Ala., faced a decision that has confronted many loggers: buy better equipment, or shut down the crew

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More plantation wood means quality problems
Southern pine lumber and plywood manufacturers must deal with quality characteristics of juvenile wood

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New mill startups scheduled for this fall

BAXLEY, GA.—ITT Rayonier's new high-production, pine dimension mill here is scheduled to be at full capacity by early October. The band/sharp chain operation has a designed capacity of 75 million bd ft.

In other news about startups:

- M. C. Dixon Lumber Co. in Eufaula, Ala., plants to start up its fully optimized band/sharp chain mill in October. It will initially manufacture about 150,000 bd ft of dimension lumber per 8-hour shift.
- J. P. Smith Lumber Co. in Menlo, Ga., is in the final stages of construction of its elevated circle mill. Startup is scheduled for late September. The mill will process some 35,000 bd ft of hardwood per 8-hour shift.
- C. H. Best & Son at Floyds Knobs, Ind., is working toward a November startup of its new high-grade hardwood band mill. The mill is designed to saw about 4 million bd ft of hardwood logs annually. ■

Mid-year earnings collapse in U.S., Canada

SAN FRANCISCO, CALIF.—Forest products companies reported sharply lower earnings in the second quarter than they enjoyed a year ago. A selection of U.S. and Canadian companies saw profits down on both sides of the border.

Among 16 American forestry firms, aggregate profits fell 32.4% to $408.76 million in the quarter. These companies' sales eased only 4.3%, however. And while Canadian companies reported a 9.0% increase in sales, their profits were off 21.7% at C$47.9 million.

U.S. lumber producers said the strong dollar hurt their profits by encouraging imports of Canadian lumber. Canada has taken about half of the market for dimension lumber, but its share of the overall U.S. market is a little over 30%.

The strong dollar also hurt earnings of integrated companies' pulp and paper operations. Prices for market pulp, linerboard and uncoated papers have been weak, thanks to poor domestic demand, while the costly dollar hurt exports.

Excessive capacity gets the blame for problems in both lumber and pulp profits. Potlatch Corp. chairman and chief executive officer Richard B. Madden told shareholders, "Oversupply and depressed prices more than offset demand for both lumber and panel products." He was referring to last year's performance, but conditions have not changed much.

"Conditions remain chaotic in our industry," commented Clifford J. Grum, president and chief executive officer of Temple-Inland Inc. "It is very difficult to forecast our markets for the rest of the year," he added.

Results were mixed at Boise Cascade Corp., where chairman and chief executive officer John B. Fery said that profits on the paper side fell, while those in building products rose. A soft U.S. economy and the strong dollar hurt paper, while consolidation of solid-wood operations pushed up profits there.

On the other hand, Willamette Industries enjoyed a record-tying second quarter. Its $17.6-million profit in the second quarter tied the mark set in 1979's second quarter. Willamette president William Swindells said an improved housing market and the company's cost-cutting and productivity programs boosted profits on building materials. Paper earnings were flat.

Harry Merlo, Louisiana-Pacific's chairman and president, expects some improvement in pulp and paper prices in the fourth quarter. Lower pulp inventories and a slightly weaker dollar should boost exports. As for the second quarter, Merlo said the stronger building products market "was certainly the bright spot."

Georgia-Pacific Corp. and Southwest Forest Industries reported their building products businesses did well, while pulp operations lost money. ■

U.S. forest industry results (second quarter 1985)

Companies	Sales ($000)	% Chg '85/84	Earnings[1] ($000)	% Chg '85/84
Boise Cascade	952,730	-4.6	31,680*	-5.4
Champion Intl.[2]	1,598,836	38.8	43,346	8.0
Chesapeake Corp.	86,812	2.9	5,402	-11.4
Crown Zellerbach	769,400	-0.3	21,500	-33.8
Georgia-Pacific	1,794,000	7.4	67,000*	1.5
Hammermill Paper	437,418	-3.5	10,814	-36.3
International Paper	1,200,000	0.0	35,200	-47.5
Louisiana-Pacific	344,970	6.3	4,970	-33.9
Pacific Lumber Co.	67,164	-10.1	10,082	-25.7
Pope & Talbot	85,262	8.6	1,835	-30.1
Potlatch Corp.	248,619	-3.9	10,543	-33.8
Scott Paper	761,100	6.9	53,100	0.4
Southwest Forest	178,850	-14.7	(2,876)*	n.m.
Temple-Inland	326,500	-0.9	24,200	-16.0
Union Camp	477,605	-5.9	24,715	-51.8*
Westvaco	436,226	-2.4	22,952	-18.7
Weyerhaeuser	1,400,117	-4.8	59,683	-42.5
Willamette	304,083	0.0	17,646	5.3

1. Income after taxes from continuing operations, excluding most significant items in both years.
2. Champion results include those of former St. Regis Corp., which was acquired in late 1984.
* **Boise:** includes $17.8 million pretax gain from sale of Newcastle, N.B., mill; **Georgia-Pacific:** excludes $17 million income from discontinued operations; **Southwest Forest:** loss includes $1 million pretax gain from sale of lumber unit; n.m. = Not meaningful.

Canadian forest industry results (second quarter 1985)

Companies	Sales (C$000)	% Chg '85/84	Earnings[1] (C$000)	% Chg '85/84
Abitibi-Price	662,354	12.9	21,307	3.1*
B.C. Forest Prod.	290,100	10.4	7,100	20.3
Canfor Corp.	307,400	13.1	-8,600	n.m.
Domtar	527,500	1.0	18,700*	-15.0*
Great Lakes For. Prod.	146,819	-6.5	-1,657	n.m.
Mac-Bloedel	598,000	11.9	7,800	-17.0
Weldwood	173,746	17.4	3,296	319.9

1. Income after taxes from continuing operations, excluding most significant items in both years.
* **Abitibi:** excludes 1984 extraordinary loss of $2,350,000; **Domtar:** excludes special gains of $1,300,000 in 1985 and $1,500,000 in 1984; n.m. = Not meaningful.

FI STOCK INDEX

Exch	Company	Ticker Symbol	Closing Price 7/15/85	Closing Price 8/15/85	Net Chg in Period	% Chg in Period	P/E Ratio	Annual Div Rate	Yield	52 Week High	52 Week Low
OTC	Bohemia Inc.	BOHM	11.25	10.88	-.37	-3.29	d	.10	.92	12.50	7.75
NYS	Boise Cascade	BCC	49.50	45.38	-4.12	-8.32	20	1.90	4.19	51.00	36.25
NYS	Bowater Inc.	BOW	24.00	23.50	-.50	-2.08	9	.72	3.06	25.88	19.00
NYS	Champion Intl	CHA	23.88	23.25	-.63	-2.64	d	.40	1.72	25.38	18.38
NYS	Chesapeake	CSK	35.00	36.25	1.25	3.57	10	1.24	3.42	39.50	32.00
OTC	Consol. Paper (H)	CPER	49.00	51.50	2.50	5.10	12	1.48	2.87	54.63	25.13
NYS	Crown Zellerbach	ZB	42.00	38.25	-3.75	-8.93	18	1.00	2.61	44.88	27.88
NYS	Fed. Paper Board	FBO	19.00	20.00	1.00	5.26	10	.70	3.50	27.00	16.63
NYS	Ft. Howard Paper (H)	FHP	74.13	77.00	2.87	3.87	17	1.64	2.13	79.13	56.50
NYS	Georgia-Pacific	GP	24.50	23.00	-1.50	-6.12	29	.80	3.48	27.38	20.00
ASE	Glatfelter (P.H.)	GLT	35.75	34.00	-1.75	-4.90	7	.88	2.59	35.75	19.38
NYS	Gr. Northern Nek.	GNN	40.00	38.00	-2.00	-5.00	12	1.52	4.00	41.75	31.63
NYS	Hammermill (H)	HML	35.38	38.63	3.25	9.19	14	1.36	3.52	38.63	26.88
NYS	Intl Paper	IP	49.38	48.63	-.75	-1.52	57	2.40	4.94	57.75	47.13
NYS	James River	JR	33.50	34.38	.88	2.63	11	.56	1.63	37.00	23.75
OTC	Jefferson Smurfit	JJSC	20.25	21.75	1.50	7.41	9	.40	1.84	25.25	15.00
NYS	Kimberly-Clark (H)	KMB	57.75	60.88	3.13	5.42	11	2.32	3.81	61.13	43.00
NYS	Koppers Corp.	KOP	17.75	17.63	-.12	-.68	—	.80	4.54	22.63	17.00
OTC	Longview Fibre	LFBR	24.00	24.75	.75	3.12	13	1.28	5.17	25.75	20.75
NYS	Louisiana-Pacific	LPX	22.50	19.88	-2.62	-11.64	43	.80	4.02	25.13	17.75
NYS	Mead Corp.	MEA	43.38	40.88	-2.50	-5.76	10	1.20	2.94	44.75	32.50
OTC	Mosinee Paper	MOSI	14.00	14.25	.25	1.79	9	.36	2.53	14.63	11.75
NYS	Pacific Lumber	PL	27.75	28.25	.50	1.80	18	1.20	4.25	29.25	23.63
OTC	Pentair Inc.	PNTA	30.25	28.25	-2.00	-6.61	10	.68	2.41	31.25	18.38
NYS	Pope & Talbot	POP	19.75	17.88	-1.87	-9.47	d	.80	4.47	21.50	15.25
NYS	Potlatch Corp.	PCH	37.25	33.13	-4.12	-11.06	13	1.56	4.71	38.13	28.00
NYS	Scott Paper Co.	SPP	40.88	41.75	.87	2.13	10	1.24	2.97	44.50	28.63
OTC	Sonoco Products	SONO	28.00	27.00	-1.00	-3.57	d	0.00	0.00	28.50	18.75
NYS	Southwest Forest	SWF	13.25	12.75	-.50	-3.77	—	0.00	0.00	18.75	11.75
NYS	Stone Container	STO	28.38	29.63	1.25	4.40	13	.60	2.02	39.00	24.00
NYS	Temple-Inland	TIN	38.13	37.25	-.88	-2.31	9	.64	1.72	40.38	29.63
NYS	Union Camp	UCC	37.50	38.00	.50	1.33	13	1.64	4.32	41.75	31.63
NYS	Westvaco Corp.	W	39.00	37.75	-1.25	-3.21	8	1.32	3.50	41.75	34.88
NYS	Weyerhaeuser Co.	WY	29.50	27.38	-2.12	-7.19	23	1.30	4.75	34.00	25.88
OTC	Willamette Ind.	WMTT	42.00	43.50	1.50	3.57	9	1.65	3.79	46.75	28.50
Canadian Forest Products Companies											
TOR	Abitibi-Price	—	18.00	18.25	.25	1.39	15	—	—	20.00	8.13
TOR	BC Forest Prod.	—	9.25	10.00	.75	8.11	—	.13	1.30	12.50	8.38
TOR	Canfor Ltd.	—	9.25	9.00	-.25	-2.70	d	0.00	0.00	15.50	8.25
TOR	Consol.-Bathurst (H)	—	17.25	18.63	1.38	8.00	16	.60	3.22	19.00	12.63
TOR	Crestbrook	—	8.75	8.38	-.37	-4.23	65	.05	.60	9.75	7.00
TOR	Crown For. Ind.	—	30.63	30.50	-.13	-.42	d	0.00	0.00	31.50	30.25
TOR	Domtar Inc.	—	18.75	19.88	1.13	6.03	9	1.40	7.04	19.88	14.50
MON	Donohue Inc.	—	17.00	18.00	1.00	5.88	8	.72	4.00	19.50	14.50
TOR	Great Lakes	—	20.25	22.00	1.75	8.64	25	.40	1.82	24.00	19.00
TOR	MacMillan Bloedel	—	20.63	21.75	1.12	5.43	—	—	—	29.75	20.50

Market Diary

Most Active Issues

Largest dollar gainer	Hammermill Paper	+$3.25
Largest dollar loser	Boise Casade	-$4.12
Largest percentage gainer	Hammermill Paper	+9.19%
Largest percentage loser	Louisiana-Pacific	-11.64%

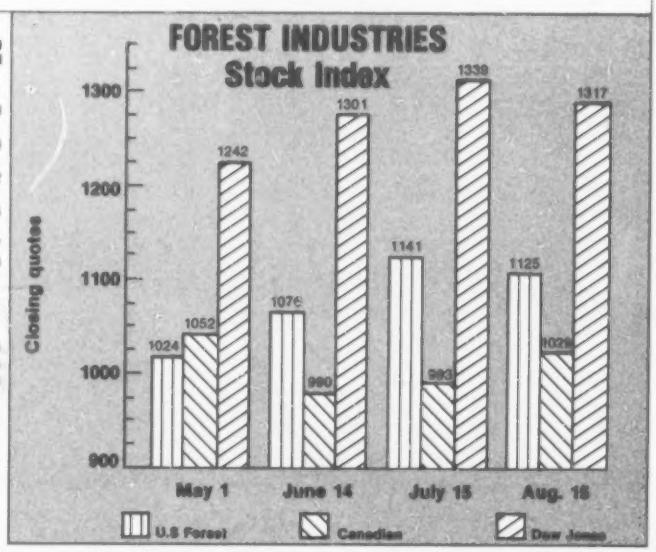
Advances, 22; Declines, 23; Unchanged, 0; New highs (H), 5; New lows (L), 0

Key

(H) = New High; (L) = New Low; (d) = Deficit.
MON = Montreal; NYS = New York; ASE = American; OTC = Over the Counter; TOR = Toronto.

All OTC quotes are represented as the bid price.
All Canadian quotes are in Canadian dollars.

	Close 7/15/85	Close 8/15/85	Net Chg in Pd	% Chg in Pd
Forest Industries Stock Index	1141.16	1125.40	-15.76	-1.38
Canadian Forestry Stock Index	992.56	1028.58	36.02	3.63
Dow Jones Industrial Avg.	1338.60	1316.98	-21.62	-1.62
Standard & Poor's 500-Stock Index	193.29	187.41	-5.88	-3.04
Standard & Poor's 400 Industrials	212.48	208.29	-4.19	-1.97
NYSE Composite	112.13	108.62	-3.51	-3.13



Compiled by Nordby International Inc., Boulder, Colo. (303) 449-0326.

The information and statistics contained herein have been obtained from sources believed to be reliable, but are not guaranteed to be all-inclusive or complete. This is not to be construed as an offer or the solicitation of an offer to sell the securities herein mentioned. This information is subject to change without notice.

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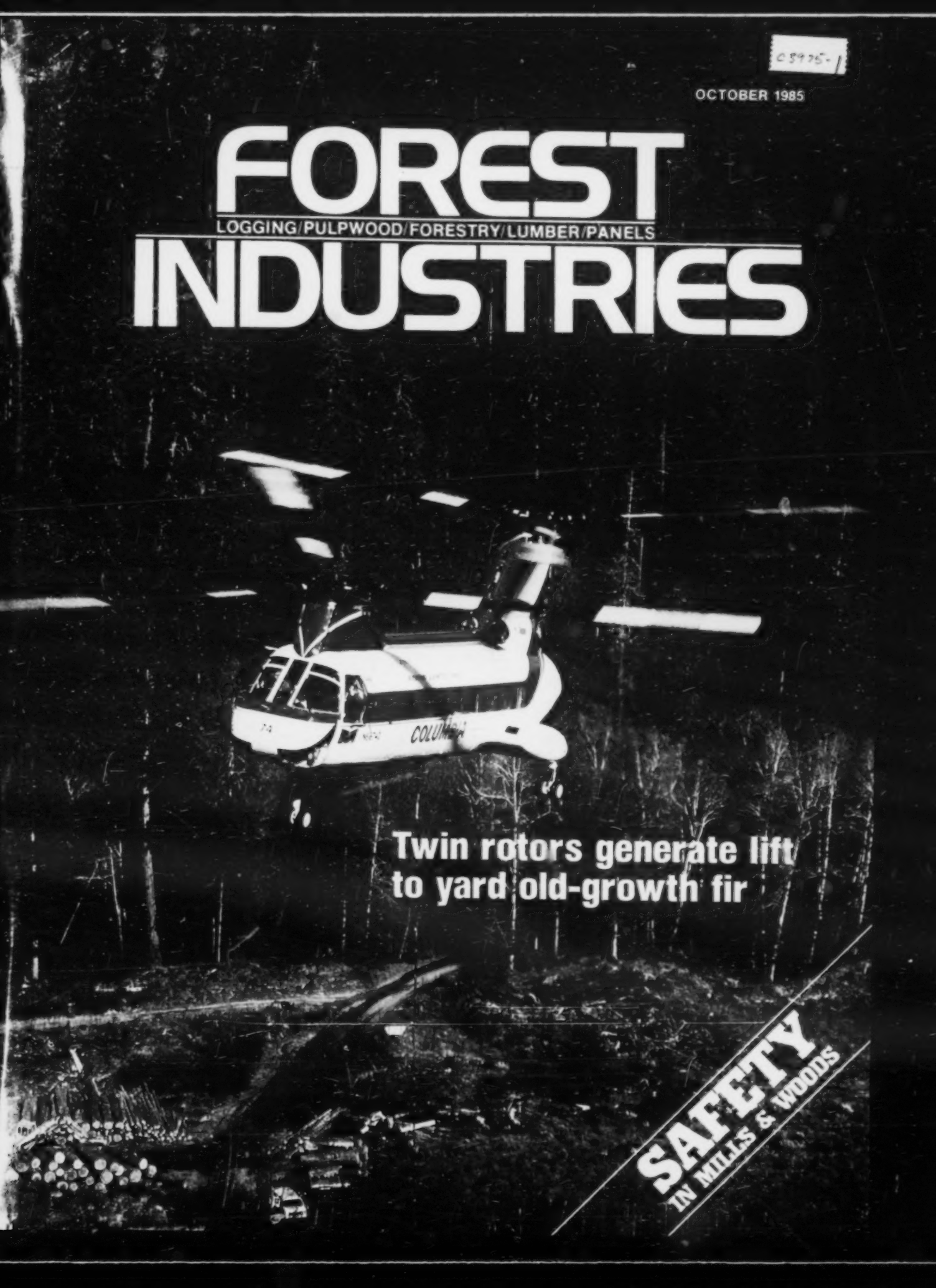
OCTOBER 1985

FOREST INDUSTRIES

LOGGING/PULPWOOD/FORESTRY/LUMBER/PANELS



Twin rotors generate lift to yard old-growth fir

SAFETY IN MILLS & WOODS

1985 Volume 112 Number 10

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Soaring with eagles: it could have happened
Lump-sum BLM sale in Coos Bay, Ore., was purchased and logged by Columbia Helicopters; old-growth Doug fir logs were sold to several mills

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New Omark feller-buncher scores high during field tests in Arkansas
Boom-mounted felling head has demonstrated impressive speed and efficiency during side row thinning, says contractor Allen Bedell, Fordyce, Ark.

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New bandmill adds quality to hardwood product line
Brothers at Begley Lumber Co., Hyden, Ky., reinvest profits and build a modern mill, the latest of their upgrading efforts

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Mechanized thinning helps forest and also yields biomass for power plants
Highly mechanized logging remains rare in the West. But Morbark equipment demo, held in Long Barn, Calif., shows one way to produce low-cost biomass for wood-fired plants

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What an operator can do to improve chain saw safety
A range of safety features is making chain saws less dangerous than before, but additional precautions must be taken by operators to reduce risk

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Toxic waste requirements cover wood preservatives
Companies using wood preservatives are advised to take steps to meet new federal requirements that govern the management and disposal of hazardous substances

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First aid/CPR training is adapted to wood industry
An emergency medical training system that can be adapted to the wood products industry has been developed by Emergency Medical Planning Inc. (EMP), located in Eugene, Ore.

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Exch	Company	Ticker Symbol	Closing Price 8/15/85	Closing Price 9/16/85	Net Chg in Period	% Chg in Period	P/E Ratio	Annual Div Rate	Annual Div Yield	52 Week High	52 Week Low
OTC	Bohemia Inc.	BOHM	10.88	10.88	0.00	0.00	d	.10	.92	12.50	9.00
NYS	Boise Cascade	BCC	45.38	45.25	-.13	-.29	20	1.90	4.20	51.00	36.25
NYS	Bowater Inc.	BOW	23.50	22.88	-.62	-2.64	9	.72	3.15	25.88	19.75
NYS	Champion Intl	CHA	23.25	22.13	-1.12	-4.82	d	.52	2.35	25.38	18.38
NYS	Chesapeake	CSK	36.25	36.25	0.00	0.00	10	1.24	3.42	39.50	32.00
OTC	Consbl. Paper	CPER	51.50	47.00	-4.50	-8.74	11	1.48	3.15	54.63	25.13
NYS	Crown Zellerbach	ZB	38.25	37.38	-.87	-2.27	18	1.00	2.68	44.88	27.88
NYS	Fed. Paper Board	FBO	20.00	17.75	-2.25	-11.25	8	.70	3.94	26.50	16.63
NYS	Ft. Howard Paper	FHP	77.00	76.75	-.25	-.32	17	1.84	2.40	80.75	56.50
NYS	Georgia-Pacific	GP	23.00	21.75	-1.25	-5.43	28	.80	3.68	27.38	20.00
ASE	Glatfelter (P.H.)	GLT	34.00	32.50	-1.50	-4.41	7	.88	2.71	35.75	19.38
NYS	Gr. Northern Nek.	GNN	38.00	35.00	-3.00	-7.89	11	1.52	4.34	41.75	31.63
NYS	Hammermill (H)	HML	38.63	41.00	2.37	6.14	15	1.36	3.32	42.88	26.88
NYS	Intl Paper	IP	48.63	48.13	-.50	-1.03	56	2.40	4.99	57.75	47.13
NYS	James River	JR	34.38	33.50	-.88	-2.56	11	.56	1.67	37.00	23.75
OTC	Jefferson Smurfit	JJSC	21.75	21.75	0.00	0.00	9	.40	1.84	25.25	15.00
NYS	Kimberly-Clark (H)	KMB	60.88	60.88	0.00	0.00	11	2.32	3.81	63.88	43.00
NYS	Koppers Corp.	KOP	17.63	17.13	-.50	-2.84	—	.80	4.67	22.63	17.00
OTC	Longview Fibre	LFBR	24.75	22.88	-1.87	-7.56	15	1.28	5.59	25.75	20.75
NYS	Louisiana-Pacific	LPX	19.88	18.13	-1.75	-8.80	39	.80	4.41	25.13	17.75
NYS	Mead Corp.	MEA	40.88	39.75	-1.13	-2.76	10	1.20	3.02	44.75	32.50
OTC	Mosinee Paper (H)	MOSI	14.25	15.00	.75	5.26	10	.36	2.40	16.25	11.75
NYS	Pacific Lumber	PL	28.25	28.13	-.12	-.42	18	1.20	4.27	29.25	24.13
OTC	Pentair Inc.	PNTA	28.25	27.00	-1.25	-4.42	10	.68	2.52	31.25	18.38
NYS	Pope & Talbot	POP	17.88	17.25	-.63	-3.52	d	.80	4.64	21.50	15.25
NYS	Potlatch Corp.	PCH	33.13	34.63	1.50	4.53	14	1.56	4.50	38.13	28.00
NYS	Scott Paper Co.	SPP	41.75	42.00	.25	.60	10	1.24	2.95	44.50	28.63
OTC	Sonoco Products (H)	SONO	27.00	27.00	0.00	0.00	d	0.00	0.00	29.50	18.75
NYS	Southwest Forest	SWF	12.75	12.50	-.25	-1.96	—	0.00	0.00	18.50	11.75
NYS	Stone Container	STO	29.63	27.00	-2.63	-8.88	12	.60	2.22	36.88	24.00
NYS	Temple-Inland	TIN	37.25	36.00	-1.25	-3.36	9	.64	1.78	40.38	29.63
NYS	Union Camp	UCC	38.00	37.13	-.87	-2.29	13	1.64	4.42	41.75	31.63
NYS	Westvaco Corp.	W	37.75	36.50	-1.25	-3.31	9	1.32	3.62	41.75	34.88
NYS	Weyerhaeuser Co.	WY	27.38	27.00	-.38	-1.39	22	1.30	4.81	34.00	25.88
OTC	Willamette Ind.	WMTT	43.50	43.00	-.50	-1.15	9	1.65	3.84	46.75	28.50
Canadian Forest Products Companies											
TOR	Abitibi-Price (H)	—	18.25	20.63	2.38	13.04	17	—	—	21.00	9.38
TOR	BC Forest Prod.	—	10.00	9.75	-.25	-2.50	—	.13	1.33	12.50	8.50
TOR	Canfor Ltd. (L)	—	9.00	8.13	-.87	-9.67	d	0.00	0.00	13.88	8.13
TOR	Consol.-Bathurst	—	18.63	16.75	-1.88	-10.09	14	.60	3.58	19.00	14.00
TOR	Crestbrook	—	8.38	7.50	-.88	-10.50	62	.05	.67	9.75	7.00
TOR	Crown For. Ind.	—	30.50	NA	0.00	0.00	d	0.00	0.00	31.50	30.25
TOR	Domtar Inc.	—	19.88	19.00	-.88	-4.43	8	1.40	7.37	22.38	14.50
MON	Donohue Inc.	—	18.00	17.00	-1.00	-5.56	7	.72	4.24	19.50	14.63
TOR	Great Lakes	—	22.00	19.75	-2.25	-10.23	22	.40	2.03	24.00	19.00
TOR	MacMillan Bloedel (L)	—	21.75	19.75	-2.00	-9.20	—	—	—	29.75	19.75

Market Diary

Most Active Issues

Largest dollar gainer	Abitibi-Price Inc.	+ $2.38
Largest dollar loser	Consolidated Papers	-$4.50
Largest percentage gainer	Abitibi-Price Inc.	+ 13.04%
Largest percentage loser	Federal Paper Board Co.	-11.25%

Advances, 5; Declines, 34; Unchanged, 6; New highs (H), 5; New lows (L), 2

Key

(H) = New High; (L) = New Low; (d) = Deficit.
MON = Montreal; NYS = New York; ASE = American; OTC = Over the Counter; TOR = Toronto, NA = Not Applicable.

All OTC quotes are represented as the bid price.
All Canadian quotes are in Canadian dollars.

	Close 8/15/85	Close 9/16/85	Net Chg in Pd	% Chg in Pd
Forest Industries Stock Index	1125.40	1099.51	-25.89	-2.30
Canadian Forestry Stock Index	1028.58	980.11	-48.47	-4.71
Dow Jones Industrial Avg.	1316.98	1307.68	-9.30	-.71
Standard & Poor's 500-Stock Index	187.41	182.91	-4.50	-2.40
Standard & Poor's 400 Industrials	208.29	204.05	-4.24	-2.04
NYSE Composite	108.62	105.85	-2.77	-2.55

Compiled by Nordby International Inc., Boulder, Colo. (303) 449-0326.

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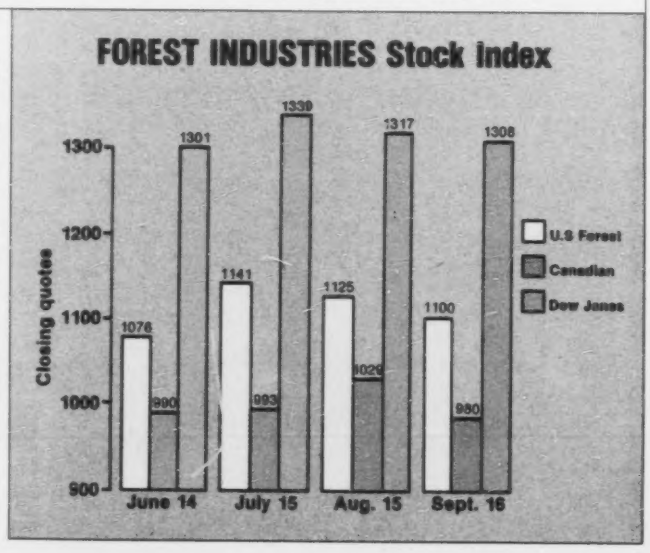

Information gathered from over 1000 injured loggers indicates that 75% of accidents result in lost time; over half of the injuries occur at the cutting site

Analyzing logging injuries: who gets hurt and why?

Washington, D.C.

The high risk of injury faced by loggers is reflected in the injury and illness rate for workers in that industry.

According to the U.S. Bureau of Labor Statistics, in 1982 there were 20.4 injuries and illnesses per 100 full-time loggers. That injury and illness rate is more than 2.5 times the national average. The incidence of lost-workday cases for injuries and illnesses was 12.9, more than 3.5 times greater than the national rate, and the rate of lost workdays, 303.5, was over five times greater than the national rate.

To gather information on the type and extent of injuries in the logging industry, the Bureau of Labor Statistics conducted a survey of 1086 injured loggers from April through June of 1982. A summary of the Bureau's findings follows.

Table 1—Selected jobs: Logging injuries, April-June 1982

Job	% of Injuries
Chopper, cutter, saw operator, saw hand	20
Faller, faller-bucker, bullbuck	14
Choker setter	10
Chaser	7
Logger	7
Skidder operator	5
Truckdriver, pulpwood hauler	5
Hooker, hooktender	4
Rigging slinger	4
Sawyer	3
Bucker, busheler, or woodsman	3
Knot bumper or stationary equipment operator	1

SOURCE: U.S. Department of Labor. Data based on selected states.

Occupation

Nearly half the injured workers were involved in jobs that dealt almost exclusively with cutting timber or trimming logs. As can be seen from Table 1, 16% of the workers were involved in yarding at the landing site (chaser, hooker or hooktender, rigging slinger, knot bumper, and stationary equipment operator). An equal proportion were classified either as choker setter or skidder operator—jobs involved in transporting logs away from the cutting site.

Age, experience and pay

Three-fifths of those injured were less than 35 years old and, of these, about one-third were under 25. Yet, overall, the workers were experienced, with more than four-fifths having one or more years of experience in the logging industry, and two-fifths having at least 10 years.

Nearly two-thirds of those injured were paid on an hourly or weekly basis, while one-third were paid straight piecework rates. Several workers stated they felt piecework encouraged unsafe practices since they had to work as fast as possible to make what they considered a living wage. However, hourly or weekly paid workers occasionally complained that they too were under pressure to produce as fast as possible regardless of safety. Slightly more than one-fifth of the workers indicated that working too fast was a contributing factor to their accidents.

Lost time due to injuries

Nearly three-fourths of the workers surveyed lost time because of their injuries. The average lost-time case resulted in 23 days away from work. One-fifth of those injured required hospitalization, with an average hospital stay of six nights.

The most common injuries were cuts, lacerations, or punctures, which affected one-fourth of the workers, followed by sprains and strains, suffered by slightly fewer than one-fourth of those surveyed. Fractures accounted for about one-seventh of the injuries. About one-third of the cases involved injury to the legs, ankles or feet. Of these, injury to the legs, just over one-fifth of the cases, were more frequent. Injuries to the trunk (including back injuries) occurred in almost one-fourth of the cases, and injuries to the upper extremities occurred in just under one-fourth of the cases.

Activity at time of accident

Nearly one-quarter of the injuries were accounted for by workers felling trees, while those limbing and bucking accounted for 15 and 12% of the injuries, respectively (Table 2). Workers who were choker setting or hooking up turns accounted for 14% of the injuries; workers engaged in tractor or cable skidding operations, 9% of the injuries. The proportions of injuries resulting from chasing activities and loading or unloading were 5% each. Some 4% of the injuries occurred to workers involved in rigging cable yarding systems (setting up skid cables, blocks and tackles, or guylines).

Location of accident

The logging site can be roughly divided into three major areas: the cutting site, the landing, and the skid trails in between. More than one-half of all injuries occurred at the cutting site; one-fifth at the landing; and slightly fewer than one-fifth occurred on skid trails. Most of the remaining injuries took place on roads while workers were transporting logs, equipment or other crew members.

Sloping terrain and ground cover of any type tend to hamper movement of fallers and other personnel, whether moving from one cutting site to another or running from falling trees. Nearly three-fifths of the workers reported that their accidents occurred on moderately or steeply sloped terrain, and more than three-fifths said the ground was covered with moderate to heavy brush or ground cover.

Protection equipment

Most workers were wearing some personal protective equipment; only 4% said they weren't wearing or using any. Almost nine out of 10 workers were wearing hard hats at the time of injury, and three out of four were using gloves.

Boots with caulked or corked soles were worn by three out of five workers, while nearly three out of 10 had boots with steel toes. Three out of 10 workers were equipped with either chaps or kneepads to protect their legs from injury.

A number of workers volunteered comments about personal protective equipment. Their remarks often had to do with comfort, visibility, being able to hear noise in the work area, or the practicality of wearing the equipment.

Footwear was described as a problem by several workers who noted that boots suitable for general logging work or operating equipment were not necessarily good for walking on logs (spiked boots were recommended for that purpose). On the other hand, spiked boots were not practical for most other logging activities, particularly operating equipment.

Several workers were decidedly against wearing chaps, saying that they restricted movement. One worker specifically stated he believed his injury occurred when his legs became entangled in his chaps while running from a falling tree. He tripped and was hit by the tree.

Some workers commented that, although goggles were useful in protecting the eyes from sawdust and other flying objects, they were usually hot and uncomfortable or restricted peripheral vision. Hearing protection was perceived by some to be a hazard since workers call warnings to each other. However, some workers overcame this problem by using whistles or a visual code system to indicate such things as falling trees or moving equipment in the vicinity.

Workers who were operating tractors, trucks or other mobile equipment when they were injured were asked about the safety features on the equipment. Although there were seat belts in 32 of the 51 vehicles, only six workers indicated they were using them. Almost three-fifths of the vehicles had cages or covers to protect against falling objects, while slightly more than one-half had rollover protection.

More than seven out of 10 workers injured by chain saws indicated the saws had one or more safety features. The most common, present on four of the 10 saws, was a low-kickback chain. More than three out of 10 saws were equipped with chain brakes, and two out of 10, with deadman switches.

Workers struck by wood

Nearly one-fourth of the workers were struck or crushed by limbs, trees, or logs, making this one of the most prominent causes of injury. These accidents occurred in a variety of ways. Deadwood or "widow makers" were sometimes released spontaneously or during the felling process as the tree dropped or as it struck nearby trees on the way down. Factors such as twisted or leaning trunks, rotted wood, or wind caused some trees to fall in unexpected spots. If a tree did not fall into a clean "bed," wood or ground litter catapulted into the air when the tree struck the ground.

Of the 259 workers struck or crushed by wood, about one-half were hit by falling trees, limbs, or branches, while one-quarter were struck by wood catapulted through the air by "springpoles," which occur when wood under tension suddenly is released.

Table 2—Selected activity at time of accident April-June 1982

Activity	% of Injuries
Felling	23
Limbing	15
Choker setting or hooking up a turn	14
Bucking	12
Tractor or cable skidding	9
Chasing	5
Loading/unloading	5
Rigging	4

SOURCE: U.S. Department of Labor. Data based on selected states.

Accidents involving falls

Almost one-quarter of the workers received injuries as a result of slips, trips or falls.

Of these, three-quarters either fell from elevations or fell to the same level; falls from elevations and falls to the same level occurred in equal numbers. About three-fifths of the workers who fell from elevations were walking or standing on logs. Many of these workers simply lost their balance on these uneven surfaces and fell to the ground, while other falls were attributed to slippery or loose bark or to the sudden shifting of the log.

One-fourth of the falls from elevations occurred when workers fell from mobile equipment, most frequently trucks. One-tenth of the workers were originally at ground level but fell to lower surfaces, often into ravines or stream beds.

Of those who fell to the same level, about two-fifths fell to the ground. These falls were accounted for by such things as protruding roots, deadwood, leaves, vines, and other woods litter as well as rocks and uneven ground. One-fourth of the workers who fell to the same level landed on felled trees or other wood on the ground.

Accidents involving chain saws

One-fifth of the workers were injured by chain saws. Nearly two-thirds of these workers said the accident occurred when the saw kicked back. Most of the other injuries involving chain saws occurred when workers fell on their saws. Over three-fourths of those injured by chain saws were cutting with the saw when the injury occurred.

Safety training

More than six out of 10 workers indicated they received safety training in logging.

Supervisors of employees provided safety training for four out of 10 workers, and nearly three out of 10 were trained by a coworker.

Contributing factors

Almost two-thirds of the workers cited one or more natural conditions that contributed to their accidents. Close to one-fifth said heavy brush or ground cover was responsible, while slightly more than one-tenth blamed steep terrain. About one-tenth also indicated that springpoles or wood under tension caused their accidents.

In responding to a question regarding other contributing factors, more than one-fifth of the workers blamed their accidents on working too fast. The next more frequently mentioned contributing factors were: misjudging time or distance needed to avoid injury, cited by one-seventh of the workers; and being unaware of hazards, one-tenth of the workers.

Time of accident

Workers were asked to provide information about when during the workday their accidents occurred.

Relatively few accidents, 7%, happened during the first hour of work and slightly more than double this amount occurred during the second hour. Accidents peaked during the third hour of work and dropped off during the rest of the workday.

In general, those responding to the survey took pride in the physical demands of their work and seemed resigned to the fact that they would experience accidents occasionally. Although climbing through underbrush or up and down hills or mountains while carrying a chain saw or other logging equipment places stress on the body, relatively few workers, only 64, attributed their accidents to fatigue.

However, one-third of the accidents occurred when the person injured had been working from 1 to 2 hours without a break, and a similar proportion occurred after two to four hours of unbroken work. ■

Changing requirements worldwide, plus new technology developed for domestic applications, add up to greater export opportunities for Finnish machinery suppliers

Foreign trade lifts Finland's economy

OVER TIME, machinery developed by Finnish manufacturers to suit domestic forest industry requirements has been considered too specialized for effective use—or at least customer acceptance—outside the Nordic countries. This was particularly true in shortwood logging applications.

This picture has changed dramatically in recent years. In many cases, experience gained in harvesting and processing Nordic timber has given Finnish machinery suppliers a technological edge in international markets, thus the incentive to bring their marketing guns to bear on these targets.

When the Finnish forest industry found itself facing the need for thinning systems, for example, machinery suppliers easily adapted techniques developed for shortwood logging and designed a new generation of small harvesters and forwarders which are attracting attention, and receiving a marketing push, in North America.

Meanwhile, machinery makers have been quietly marketing applicable logging products such as cranes, forest tractors and clam-bunk skidders to developing countries, building a worldwide reputation for product quality, while an efficient distributor network in the UK has proven effective in matching Finnish machines to UK requirements.

In solid-wood manufacturing, the large plants and high-volume small-log processes typical of Finland have formed the base for a sawmill and panel machinery industry that is innovative and competitive by worldwide standards in the related fields of processing machinery and electronic process control technology.

Joint-venture and reciprocal licensing connections between Finnish and North American sawmill and panel machinery companies have accelerated a technology exchange which illustrates both the greater degree of commonality among elements of the wood industry on both sides of the Atlantic Ocean and the strategy of Finnish manufacturers to expand export sales.

Distribution of Finnish forest industry exports, 1983

Destination	FIM million	%	%
Europe	20,306		80.9
EEC	13,881	55.3	
Great Britain	4,900	19.5	
W. Germany	3,390	13.6	
France	1,777	7.1	
Netherlands	1,135	4.5	
EFTA	2,006	8.0	
Sweden	802	3.2	
Comecon-Eur.	4,063	16.2	
USSR	3,686	14.7	
Asia	1,799		7.2
Africa	1,204		4.8
N. America	872		3.5
USA	824	3.3	
Latin America	409		1.6
Oceania	503		2.0
TOTAL	**25,093**		**100.0**

SOURCE: Board of Customs Statistics.
NOTE: Approx. FIM 6.0 = US$1.0

Finland's prosperity and economic development are linked to a dependence on foreign trade. Exports account for about one-third of the gross domestic product. Finnish foreign trade is preponderantly oriented to Western Europe, which in 1982 accounted for 51.4% of its imports and 54.1% of its exports. The Socialist countries were next, with 27.8% of imports and 28.8% of exports, of which the Soviet Union accounted for 26.1% and 28.1%, respectively.

On the export side, the Finnish forest industry has traditionally been the No. 1 earner of foreign currency, accounting for 38% in 1982. Combining solid-wood and pulp/paper segments, it accounts for over one-fifth of the gross value of total industrial production and employs one-fifth of the industrial labor force.

Approximately 80% of the entire Finnish forest industry's production is exported, while the input of imports in processed wood-based goods is only 15%. Despite production and capacity increases, the ratio of forest industry exports to total Finnish exports is declining as other categories grow at a faster rate. Forest products accounted for 69% of total exports in 1960 and 38% in 1982. Production of the Finnish forest industry has quadrupled between the early 1950s and 1982.

Production of sawn lumber declined somewhat after 1960 until the devaluation of the Finnmark in 1967. Output then rose to a peak of 8.1 million m^3 in 1973. In 1983, Finland's 300 major sawmills produced 8.0 million m^3, of which 62% was exported. (The Central Assn. of Finnish Forest Industries, which supplied these statistics, estimates there are another 8200 small sawmills supplying local needs.)

While forecasts that European consumption of solid-wood products would increase at a slow rate have limited growth in the sawmilling segment of the industry, sizeable investments are being made in rationalization, integration, automation and marketing coordination. Finland's biggest export market for sawn lumber is Great Britain.

Finland is the world's leading exporter of plywood. The biggest markets are West Germany, Great Britain and Sweden. In 1983, Finland's 26 plywood and veneer mills produced 580,000 m^3, of which 85% was exported. Parallel with an expansion of capacity in recent years has been an improvement in product quality and diversification into product innovations as a result of the development of new glues and gluing techniques, and development of more productive manufacturing techniques.

The particleboard industry is the youngest segment of the wood-based panel industry, having started in 1956, but grew 10-fold between 1959 and the peak year of 1975. Domestic consumption and export volumes have declined since the late 1970s. Production of 11 particleboard mills in 1983 was 605,000 m^3, of which 31% was exported.

About 55% of fiberboard production is exported, with the UK the No. 1 market. Hardboard comprises 85% of fiberboard exports, vs. insulation board and medium-density fiberboard (MDF).

—The Editors

PICTURED ON THE COVER of this special section is a new Lokomo Makeri 34T thinning harvester working on a forest site near the factory in Tampere.